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NEW SERIES
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THE PITTSBURG CONVENTION OF FOUNDRYMEN AND MANUFACTURERS

A REPORT OF THE PROGRESS BEING MADE BY THE VARIOUS COMMITTEES IN CHARGE OF THE TREMENDOUS UNDERTAKING.

BY OUR PITTSBURG CORRESPONDENT.

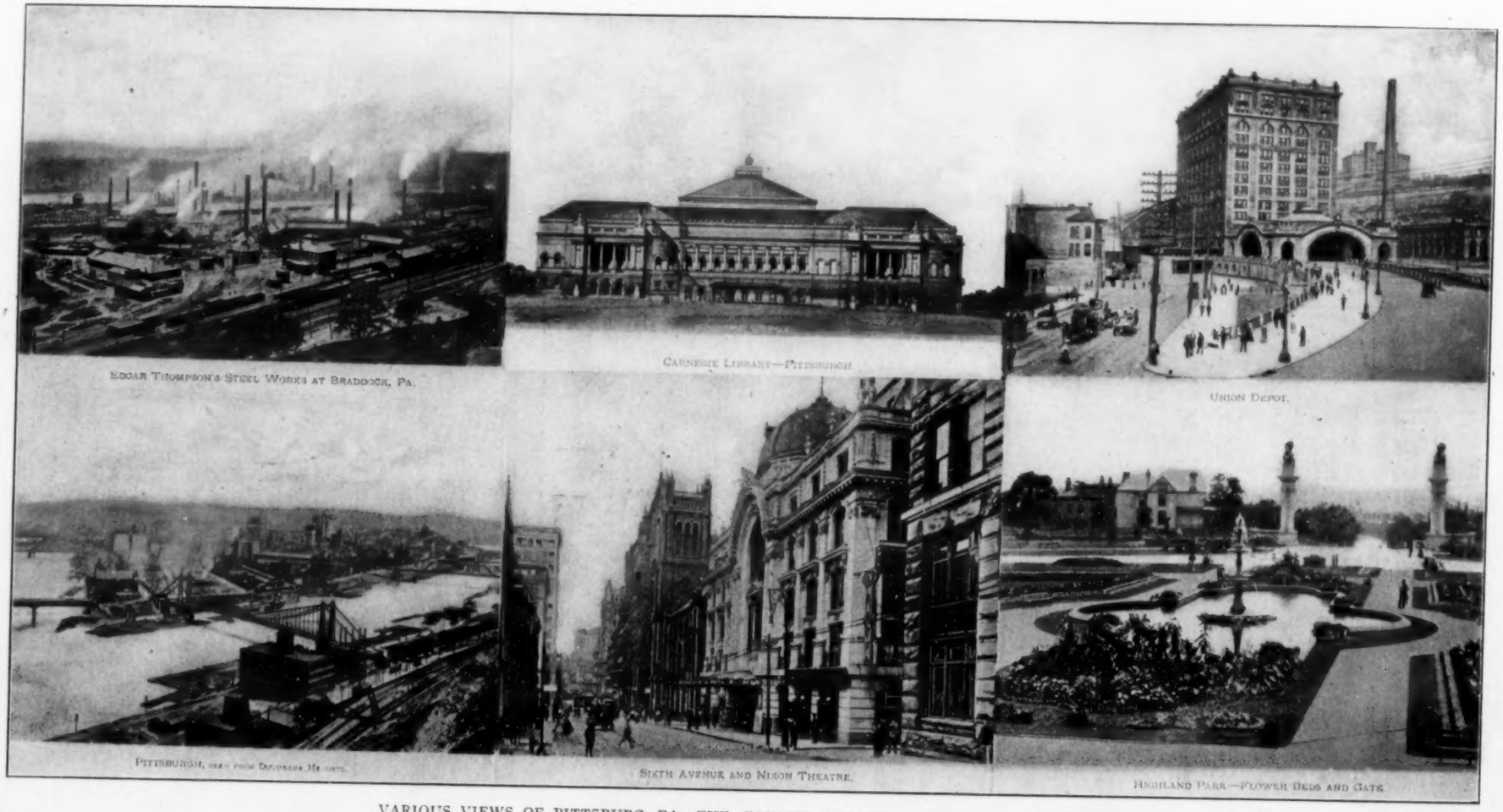
Plans for the convention of the American Foundrymen's Association and the American Brass Founders' Association in Pittsburg, Pa., May 23 to June 1, are moving along smoothly and there remain only the details to be completed before the first arrivals come to the great meeting. Committees in charge of the work have been laboring steadily and faithfully. The immensity of the meeting makes the work voluminous and requires much time. A meeting of the Pittsburg Foundrymen's Association was held on Monday, May 1, at which Dr. Richard Moldenke, national secretary-treasurer of the American Foundrymen's Association was present to discuss the convention plans with the Pittsburgers. Dr. Moldenke came from his home at Watchung, N. J., for this purpose.



THE SKYLINE OF PITTSBURG, PA., THE CONVENTION CITY OF THE ALLIED FOUNDRYMEN'S ASSOCIATIONS FOR 1911.

The question of hotels for the accommodation of the visitors is a live one, inasmuch as most of the hotels are fairly well filled at all times. Pittsburg's great need of hotels has seldom been more forcibly brought to public attention, as it has at present. The promise of two new modern and high-class hostelries is made within a year or fifteen months, which gives relief for the future, but not the present. One of these hotels is to cost $6,500,000, and is to be known as the Hotel Oliver, and the other will cost $2,000,000, and has not been named, though ground is to be broken in May for the building. Both are to be in the center of the business district. At the Pennsylvania State Exposition building, where will be held the annual exhibition of foundry supplies and machinery by the Foundry and Machine Exhibition Company, the clearing away of all obstructions for the exhibits has begun. It is a big task and thousands of exhibits are to be shipped during the next week or so. The space provided for these will be greater than could be provided in Madison Square Garden, New York, and all has been taken up. Among the exhibitors that are already booked and placed on the records, are those of adding machines; blowers, cupolas; coke, foundries; fire brick; core machines, power and hand; crucibles, retorts, etc.; cranes, electric traveling; compressors, air; cars, industrial railways; electric controllers; chain block; drill presses; drill grinding machines; electro-plating machinery; factory construction materials; ferro alloys; foundry supplies; melting and annealing furnaces; gear cutting machines, gear hobbers; disc grinders; automatic grinding and polishing machinery; carborundum and emery grinding wheels; air and electric hoists; automatic and turret engine lathes; electric lifting magnets; machine shop tools and supplies; power, automatic and hand molding machines mold driers; electric motors; non-ferrous metals; pattern making machinery; pig iron; pneumatic tools; pneumatic and electric riveting machines; sand molding; sand mixing machinery; sand blast machinery, vanadium products; welding and cutting methods, Thermit, oxhydric processes, etc., and wood working machinery.

This directory of the exhibits gives some idea of the wide scope of the exhibit and the high character of the display. It is estimated that the exhibits will represent a value of $2,000,000. Much of it will be in actual operation to demonstrate the practical value of the same in plants. The fact that all these exhibits can be seen under



VARIOUS VIEWS OF PITTSBURG, PA., THE FAMOUS CITY OF A THOUSAND MILLIONAIRES.

Pittsburg itself has a population of about 533,000.

The Pittsburg district comprises a population of almost 2,500,000, all living within a radius of 40 miles of the court house.

Pittsburg has over 5,000 manufacturing plants, directly employing close to 350,000 persons.

The annual payroll of Pittsburg's mills and factories is over $500,000,000.

The average wage paid the men in these mills and factories is $660 per year, as against an average for the country of $475, these figures including women, day laborers and all cheap forms of manual labor.

THE GREATNESS OF PITTSBURG

Pittsburg jobbers supply 10,000,000 people, and their total annual business is over $1,000,000,000.

Pittsburg is the second city of the country in banking capital and surplus; the combined capital of her banks and trust companies is some $5,000,000 greater than the combined capital of the imperial banks of Russia and Germany, the organized banks of Scotland and Ireland and the Bank of England, and her savings banks and trust companies alone have had an average total deposit for several years past of $165,000,000.

In the following products the Pittsburg district leads the world: Iron and steel, coal and coke, glass, electrical machinery, aluminum, vanadium, steel cars, tin plate, air brakes, preserved fruits and pickles, cork, white lead, clay products and cement.

Pittsburg has 22 parks, containing 1,387¼ acres, valued at over $7,000,000, on which she is spending over $300,000 each year in maintenance alone.

Pittsburg has 56 fire companies and engine houses and 621 paid firemen.

the same roof as the meetings are being held makes the possibilities for educational benefit more than ordinary in value.

Regarding the papers to be presented at the convention by the American Brass Founders' Association, of which a brief summary was presented a month ago, a list of the papers and those who are to present them has been completed and is as follows:

"Alloys," by Dr. W. R. Whitney.

"Corrosion of Brass Foundry Products," by Wm. Vaughan, of A. D. Little, Inc.

"The Pouring and Melting Points of Some High Grade Bronzes," by C. P. Karr.

"Vanadium and Its Non-Ferrous Alloys," by V. C. Lassen.

"The Pyrometer and the Aluminum Foundry," by H. W. Gillett.

"Non-Ferrous Foundry Economics—Refinements," by E. A. Barnes.

"Determination of Nickel in Alloys," by S. W. Parr.

"Equilibrium Diagram," by H. W. Gillett.

While the committee of Pittsburg founders has been working hard they have been slow in announcing the names of the various committees that will have charge of the convention from the entertainment standpoint. However, the most important committee has been made public that which will be known as the Reception Committee. The other committee will not be known for some days, as acceptances have not all been received. During the latter part of April, there was much time given to the plans for the entertainment of the ladies of the party to come to Pittsburg. This duty is in the hands of able men, experienced in their work. That all will have a delightful time is positively assured. In fact, the ladies will be kept so busy that they will not be allowed to think about home a minute. Then there is the Baseball Committee, which is arranging for the afternoon at which the entire delegation will attend the ball game between the Pittsburg and Cincinnati teams of the National League in Forbes Field, which is said to be the largest and most costly athletic field in the world. This field will seat comfortably 30,000 people, and as high as 40,000 have been in attendance at games there. Assurances are given that all delegates will have accommodations at this game, and it is believed that foundrymen, as a rule, are baseball fans of the most violent type. They are in Pittsburg, at any rate.

The most elaborate detail of the entertainment will be the matter of plant visitation, which will take up much time, and give a broader conception of the vast industrial enterprise of Pittsburg than any other means possible. A route is being planned for taking the visitors by a special train through the miles of mills and furnaces and foundries that cluster about the city, a distance of many miles.

The names of the reception committee which will have general supervision of all these details are as follows:

RECEPTION COMMITTEE.

Eliot A. Kebler, chairman, M. A. Hanna & Company, Pittsburg, Pa.

Charles A. Anderson, Jr., Pittsburg Valve & Foundry Company, Pittsburg, Pa.

John Brown, Damascus Bronze Company, Allegheny, Pa.

L. V. Blue, Wheeling Mold & Foundry Company, Wheeling, W. Va.

S. R. Costley, J. S. McCormick Company, Pittsburg, Pa.

E. L. Dawes, Standard Sanitary Manufacturing Company, Pittsburg, Pa.

H. T. Frauenheim, Herman Pneumatic Machine Company, Union Bank Building, Pittsburg, Pa.

L. W. Frank, Duquesne Steel Foundry Company, Pittsburg, Pa.

Brooks J. Goodin, Matthew Addy & Company, Pittsburg, Pa.

Frank B. Goddard, United States Graphite Company, Pittsburg, Pa.

Ernest Hillman, J. H. Hillman & Son, Pittsburg, Pa.

W. J. Ireland, Jamison Coal & Coke Company, Pittsburg, Pa.

John L. Kirk, 319 Third avenue, Pittsburg, Pa.

J. D. Montgomery, American Lumber & Manufacturing Company, Pittsburg, Pa.

Richard Muse, Marshall Foundry Company, Pittsburg, Pa.

John McLaren, Phillips & McLaren, Pittsburg, Pa.

H. W. Petty, American Steel Foundries, Pittsburg, Pa.

Horton Penrose, L. & R. Wister Company, Pittsburgh, Pa.

J. M. Phillips, Phillips Mine & Mill Supply Company, Pittsburg, Pa.

T. C. Ward, Hickman, Williams & Company, Pittsburg, Pa.

Thomas Ward, Pittsburg Brass & Manufacturing Company, Pittsburg, Pa.

A good many features about Pittsburg, that will interest foundrymen, are incidentally talked of. Within view of the convention hall, across the Monongahela River,

FOUR HUSTLING SECRETARIES.



DR. RICHARD MOLDENKE.
Secretary-Treasurer American Foundrymen's Association.



C. E. HOYT.
Secretary Foundry and Machine Exhibition Company.



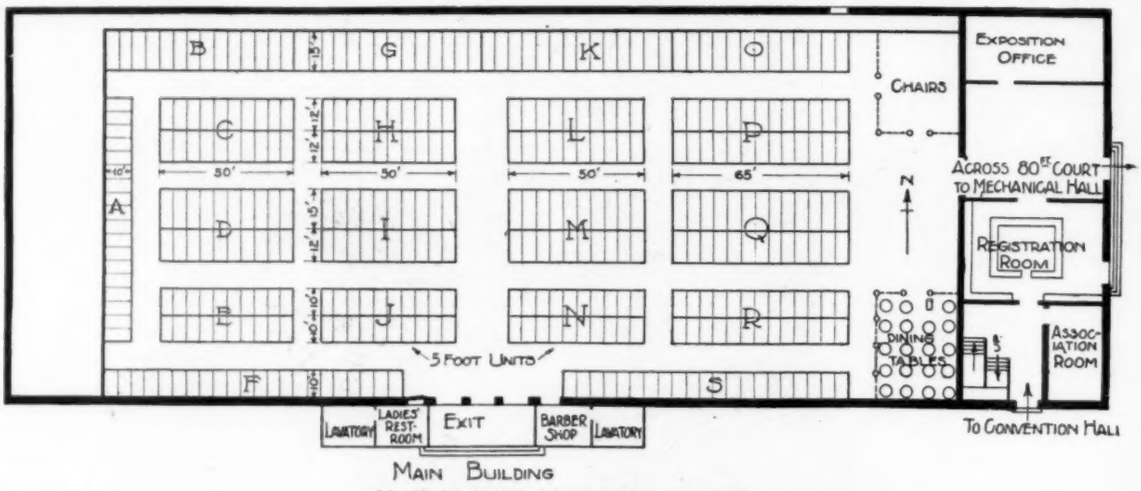
W. M. CORSE.
Secretary-Treasurer American Brass Founders' Association.



HUGH McPHEE.
Secretary Associated Foundry Foremen.

stands the famous Clinton blast furnace, one of 59 blast furnaces in Pittsburg and its environs, and this old Clinton stack is the oldest in continuous service, that exists in Pittsburg today. More than this, it is the first blast furnace built to melt iron by coke, instead of charcoal. All about the city are a forest of stacks, busy smelting ore into pig iron, much of which, of course, is for steel

he will go to the alphabetical division "B," where he will present his card, saying John Brown & Company are members of either or both associations, and he will register as John Jones of John Brown & Co. The members of the Associated Foundry Foremen will, of course, register individually, under the proper alphabetical division.



PLAN OF MAIN EXHIBITION BUILDING.

A list of the exhibitors, which are 100 in number, the program of proceedings, and a view of the building were shown in THE METAL INDUSTRY for April.

making, but not a few turning out foundry grades. Among the largest foundries in the district is that of the Jones & Laughlin Steel Company on the south side, which is said to be one of the most modern in equipment in the country. These, with the innumerable foundries working in iron and steel, and metals, form a collection within close range that will prove an interesting feature of the convention.

The Registration Committee, by I. E. Brundage, wishes to advise association members that the registration at the Pittsburg Convention will be conducted in much the same manner as last year at Detroit. To expedite the registration and facilitate the work at the counter, they have the following requests to make:

First: That each person registering will do so according to the name in which the membership stands, for instance, if John Jones is representing John Brown & Co., who are members of the A. F. A. or A. B. F. A.,

Second: It is also requested, when convenient that those registering will present their business card, bearing their own name and firm name, thus making sure that the names will be recorded correctly.

With these advance hints it is hoped to make the registration an ideal one for all concerned.

Secretary Hoyt reports under date of May 1 that: "Nominations for location of space have been coming in all the week and assignments are now being made. It is evident that all cannot have their first choice, but we believe all can be satisfied. Judging from the selections made every section of the building is considered by some to be the most desirable and first choice.

"Remember that the show opens Tuesday evening, May 23, at 7 o'clock, and that your exhibit must be ready by that time. It is assured that the 1911 show will surpass all others in number of exhibitors and in diversity of lines shown. Indications from all sources assure a record-breaking attendance."



THE $1,000,000 FORBES BASEBALL AMPHITHEATRE AT PITTSBURG, PA., ONE OF THE CONVENTION ATTRACTIONS.

THE METAL INDUSTRIES OF PITTSBURG

AN INTERESTING DESCRIPTION OF THE COMMERCIAL RESOURCES OF THE FAMOUS STEEL CITY.

BY F. C. WILKES

For more than a century, the name of Pittsburg has been associated with the production of iron, glass and coal. For nearly a century, it has been recognized as the center of these great industries, and has added to its chief products those of steel, coke, bronze, brass, copper, aluminum, lumber, vanadium, and the finished products from these raw materials. It is the only city in the country that has within its confines three great navigable rivers, the Allegheny, the Monongahela, and the Ohio, which formed the first basis for the foundation of the community. The very site for Pittsburg was approved by the Father of His Country, when but a young colonial engineer, though, as a military post it was selected prior to that time, and on the very point where the three great rivers meet, a fort had been built, that partially remains, within a stone's throw of the great exposition buildings, where the foundrymen will meet this month.

It was in the year 1757, that a band of rugged pioneers composed of Colonials and British, pushed their way over the Allegheny mountains to this point and, landing here on a Sunday morning, began to build hurriedly a defensive work, their haste being due to the fact that word had reached them that a French expedition was on its way to the same point, to forcibly take possession of the territory. Both nations realized the strategic position of Pittsburg at that time. The hustling in that time to prepare for the approaching of the enemy, has never ceased in Pittsburg, and today it is recognized as one of the busiest and hustling communities of the continent.

The struggle between the two great European powers, France and England, for control of the North American continent, centered about Pittsburg. Its streets are running over historic battle fields. Its very court house stands on "Grant's Hill," where a signal battle was fought, that turned the tide and gave the British supremacy over the French in this region. The old fort, started by the English, captured by the French, and finally retaken by the English and Colonists, bore first the name of Fort Duquesne, in honor of the French officer who commanded the expedition for his country, and then as Fort Pitt, in honor of Sir William Pitt, the then prime minister of England, who afterward was honored in naming the city Pittsburg. Thus Sir William Pitt became imperishable in local memory and history.

That Nature had intended Pittsburg to be is evidenced by the marvelous richness of the country, now covered with miles of streets and thousands of homes and great office buildings. For a time it was hard to excavate a cellar for a home without uncovering a vein of rich coal. It was found that wells sunk in the community brought forth vast quantities of salt. Iron ore was found within a few miles of the "Point," and for a time was used for many purposes. A foundry established in the latter part of the eighteenth century at the Point, was the first mentioned in the records of Pittsburg. Many small towns sprung up adjacent to the original Pittsburg. Some were on the opposite shores of the rivers and some sprung up on the hills back of the town. There were scores of them after a while, but the business and industry of the old town grew so rapidly that it gradually absorbed them all. This explains the naming of so many districts in the present city. The visitor might wonder at the hearing of directions such as Hazlewood, Glenwood, East Liberty, Brushton, Shadyside, Oakland, Lawrenceville, Minersville, Bayardstown, Allegheny, Troy Hill, etc., and the explanation is merely the fact that in the dim past these sections were once separate towns, long passed over until they are far in toward the center of the community.

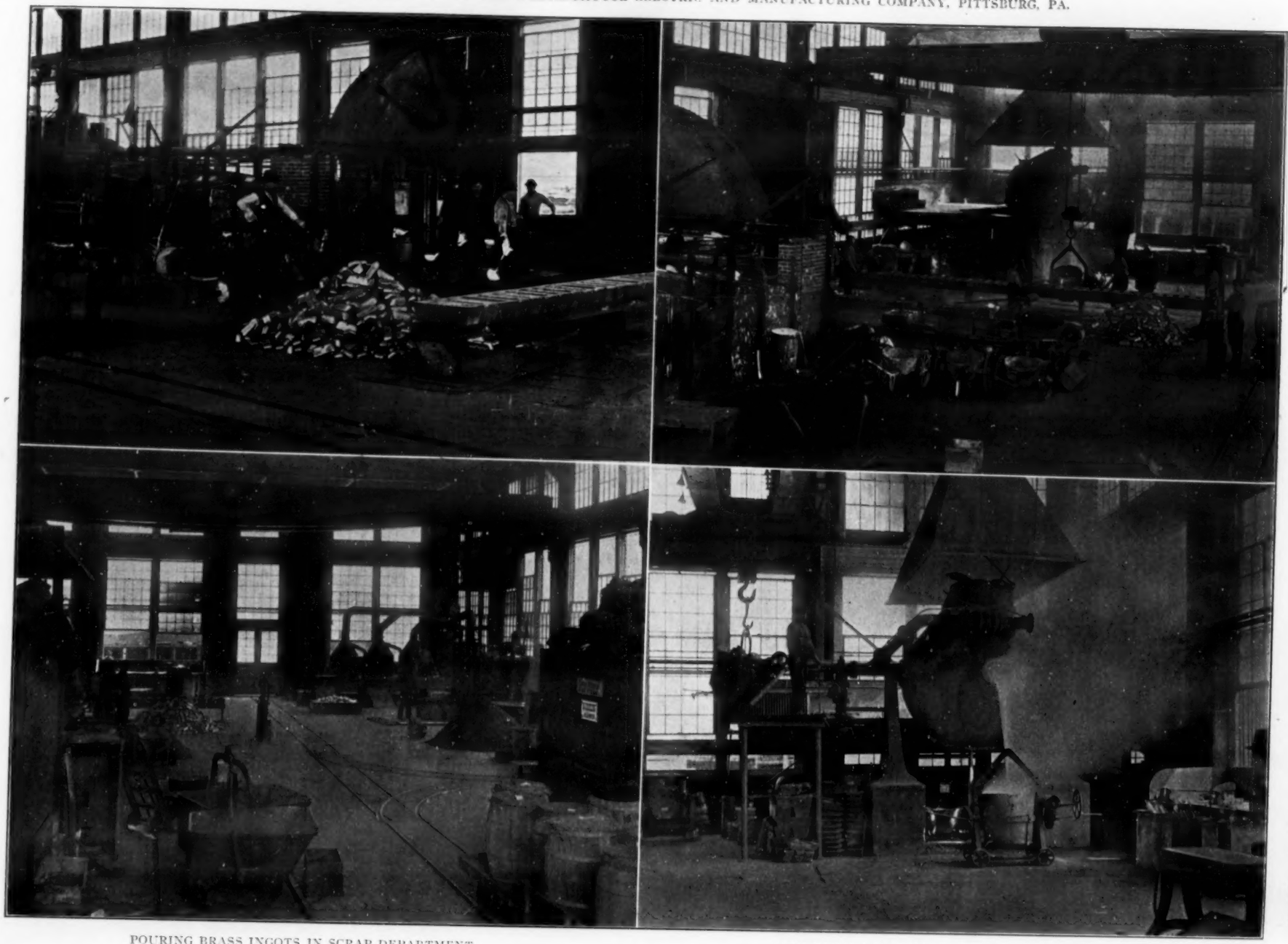
The great growth of the city has mainly its foundation on the iron and steel plants, the greatest in the world, its vast coal fields, its great glass factories, where every kind of glass is produced, from window glass and plate glass, to the finer qualities of tableware, bottles and art glass. Its lumber industries once producing lumber from the timbered hills about the community, has spread out until the lumber companies of Pittsburg own and operate in hundreds of thousands of acres of timbered lands in all portions of the country, and have made Pittsburg the second largest lumber trading point in the world. It grew in its industrial importance by the influx of great engine building works, steel bridge building, rail rolling, structural steel, rods, wire, nails and sheets for tinning and for black sheets. It would be difficult to mention all of the steel products turned out in enormous quantities in the community that had its pioneer beginning during a clash of arms and the shedding of blood.

From the small beginning, Pittsburg today, within its municipal confines, represents a wider divergence of metal industries than any other community in the world. Its population of 553,000 people represents only about 50 per cent. of the actual population of the community, for there are 64 cities and boroughs with populations ranging from 4,000 to 40,000, with their boundry lines touching those of Pittsburg, and from which pour the streams of humanity that form the shopping, clerical, mechanical and workaday forces of the community, and with a real population of over 1,000,000 souls.

The growth of the metal industries of Pittsburg had its beginning almost simultaneously with that of the iron trade. Not far from where the delegates to the various Founders' Convention will meet in the Exposition Buildings, and a little more than 105 years before, a foundry was established, the first on record in Pittsburg. It was known as the McClurg foundry, and the records accused it of having one "air" furnace. At the same time, there were coppersmiths, silversmiths, brass workers, tin workers, etc., in the town, but there is found no mention of a brass foundry until some time between 1810 and 1815, when in connection with other metal industries of Pittsburg, some small foundries for making brass were started. In 1815, the first record of a brass foundry in Pittsburg is shown by a census of the industries, stating that in the brass foundries of the town there were employed 35 men, and the total product for the year amounted to $49,633. Hard times struck Pittsburg soon after then, for in 1819 it was recorded that only 12 men were employed in the town brass foundries, and the total output of material was valued at $11,700.

It was evident in those pioneer days, when the brass men worked under the guns of the old Fort Pitt, a portion of which still remains, there was some difficulty in finding the brass works. So little mention is made of that particular industry that historians of local repute fail to discuss it. A somewhat strange coincidence insofar as the brass foundry is concerned, might be repeated in Pittsburg today. While it is possibly one of the largest producers of brass in the country, and also one of the largest consumers of the same, the individual brass foundry of Pittsburg is relatively hard to find. A few are here, it is true, but they are buried in out-of-the-way sections of the city. But by a tour of the great iron and

VIEWS OF SCRAP DEPARTMENT OF THE WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY, PITTSBURG, PA.



POURING BRASS INGOTS IN SCRAP DEPARTMENT.
GENERAL VIEW OF SCRAP DEPARTMENT.

POURING COPPER INGOTS IN SCRAP DEPARTMENT.
90-IN. SWARTZ MELTING FURNACE IN SCRAP DEPARTMENT.

steel works of Pittsburg, the searcher after brass foundries might find an amazing number of such plants and some huge ones. They are today, mainly adjuncts of the steel industry. If not, they will be found in the great engine works, electrical and machine plants, or here and there, some individual plants. The greatest brass foundry of modern Pittsburg is the adjunct of the Westinghouse Electric & Manufacturing Company. To see this foundry is to see what is considered one of the most modern plants of the kind in the country. Yet, as a business factor, it is lost in the maze of great works, where 22,000 people are employed every day and night. Next to this plant comes that of the Westinghouse Air Brake Company, another plant of wonderful equipment, where 25 tons of brass castings are turned out every day.

To the average brass founder, the foundry of the Westinghouse Electric & Manufacturing Company would prove more than interesting because of its varied forms of finished material. It is not so large in actual tonnage production as the plant of the Air Brake Company, but in numbers of different individual forms of brass, it is far greater. Through the courtesy of the company a description of the plant was made possible, as follows:

WESTINGHOUSE ELECTRIC & MFG. CO.'S BRASS FOUNDRY.

This brass foundry is 76 feet wide by 420 feet long, and is located on a second floor, underneath which is a mezzanine floor devoted to pattern storage, said conveyor machinery and the reclaiming of metal from furnace cinders. The output of the foundry is about 400,000 pounds of castings per month, which average about two pounds each. The product consists of about 25 standard alloys, and a number of special ones which are occasionally made.

A large number of pure copper castings are made, and, as all of these have a high conductivity it is impossible to use anything in the metal to obtain freedom from sponginess. A very high grade of copper castings is made on which the conductivity is about 85 per cent. One of the specialties that is made in large quantities is manganese bronze. The methods of casting this material are such that sound castings of very high strength are obtained with freedom from shrinkage spots. Other standard alloys consist of standard yellow brass, red brass, phosphor bronze, two grades of bearing bronze, acid resisting bronze, a forging bronze, pure aluminum, aluminum copper and aluminum zinc alloys, and special high resistance alloys containing copper, zinc, ferro manganese, and aluminum.

Molding machines of various types are used largely, and little hand work is done. The machines are divided into three classes, power rammed split pattern machines, vibrator power rammed and squeezers, and hand rammed. The sand is prepared, riddled, tempered, and conveyed in proper condition for use to chutes placed directly over the molding machine, thus eliminating all laborious handling and mixing of sand. As the molds are made they are placed on the floor alongside of a grating, and the metal is conveyed on a trolley with a triplex hoist attached to a point, where it is poured into the molds at the proper temperatures. When the castings are cooled, the molds are shaken out on the grating; the sand drops into a conveyor and is carried to a riddle, where all cores, brass, and nails are removed. The sand is riddled into a tempering pan, where it is sprayed with water and dropped into the elevator conveyor and the necessary new sand added. The sand is then carried by the conveyor to the foundry floor and delivered to the different chutes and floors in the proper condition for molding.

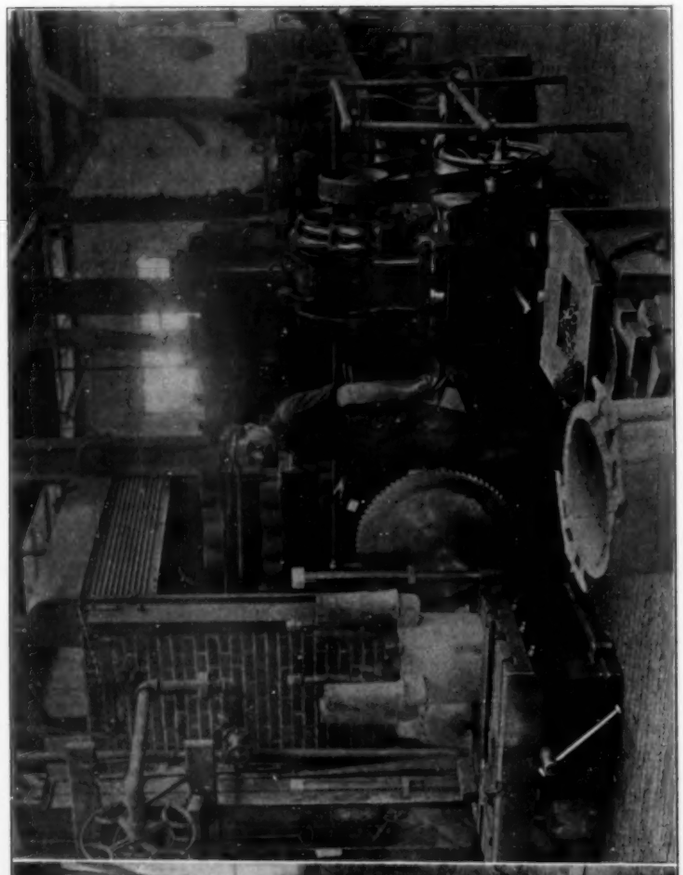
The system employed provides for a division of labor. The molder confines his efforts strictly to molding and pouring, as it has been found here that it is always advisable on intricate work to have each molder pour his own castings. The metal is conveyed to his floor and the molder is able to devote all his time to molding and pouring, as a gang of laborers shakes out the molds and removes the castings to the cleaning floor. As a result of this arrangement, the molder becomes highly skilled, is able to earn high wages, and, therefore, takes great interest in his work.

The foundry is laid out in three bays. A gang foreman is over each bay. This foreman looks after the pouring temperatures of the different alloys and lays out the work. The center bay is devoted to large work, and includes all floor and jarring machine work. It is equipped with two 5-ton electric traveling cranes, which are very fast running, and which handle all the metal and castings made in this bay, including some very large ones. One of these recently made was a condenser body which took 12,000 lbs. of metal to pour. This bay is equipped so as to make large or small castings on very short notice, as the remaining aisles are devoted exclusively to molding machines.

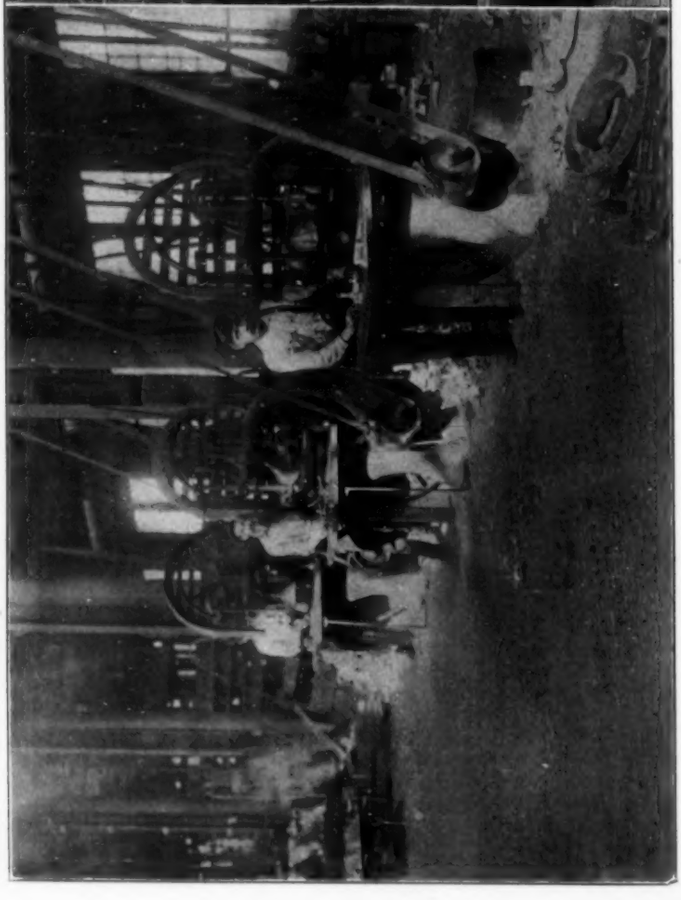
Practically all of the metal is melted in Schwartz open flame furnaces. The tuyeres are especially arranged to obtain perfect combustion, which gives an extremely satisfactory melting with very low losses. An accurate record is kept of all the metal going to the foundry. The smelting department gets a receipt for all metal delivered to the storeroom, and in turn the storeroom obtains from the head furnaceman a receipt for all metal delivered to the foundry. As the storeroom checks up every day it is impossible for any metal to get in the foundry without charge. The foundry in turn receives a receipt for the number and weight of the castings delivered to the various sections. All castings made on any day are cleaned and shipped not later than the second day after. An actual inventory is made of all metal remaining on the floor at the end of each month, and in this way a correct measure of the output and milling loss is obtained each month. With the exception of gates and risers, ingot metal is used exclusively in the brass foundry. It has been found that it pays to remelt all scrap turnings into an homogeneous ingot. This is obtained from the smelting department.

The gates and risers from all castings that can be handled are removed by metal band saws at a very rapid rate. A Taylor Newbold cold saw is used to cut off the gates and risers of manganese bronze and large castings. All castings are sand blasted, and the dust in the sand blast room is removed by a Sly dust collector, making the room almost dustless while the blast is operating. A rigid inspection is made on all castings, and many are made of which a physical test is required for each heat; also, a check analysis is frequently required of the finished castings.

A central scrap or smelting department is operated independent of the brass foundry, and this scrap department receives, sorts and refines all scrap metal and runs it into ingots of suitable size for use in the foundry. The result of this practice is to greatly improve foundry conditions. The scrap department is operated by the superintendent of the brass foundry, in conjunction with a laboratory, where chemists and metallurgists are always available for consultation and analysis and where physical tests can be quickly made. This insures a correct analysis of all ingots and reduces handling labor in the foundry, and at the same time reduces the time and cost required to melt the metal. The remelting greatly improves the metal and gives uniform color and mixture and quality of castings.



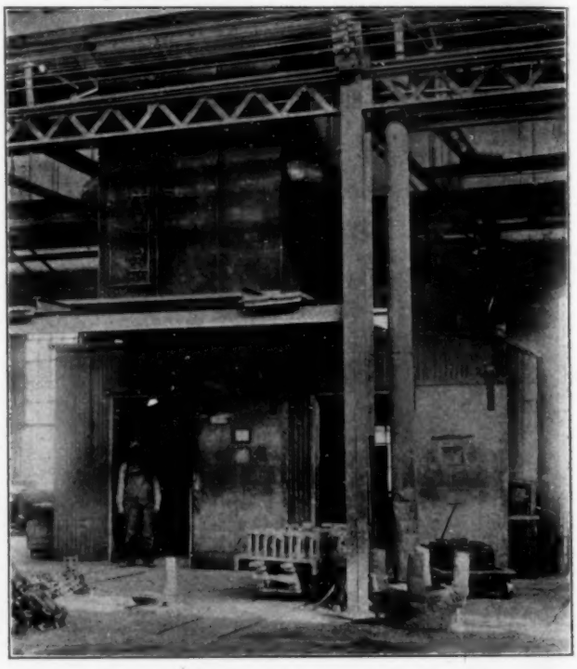
COLD SAW IN THE BRASS FOUNDRY.



METAL BAND SAWS IN BRASS FOUNDRY.

VIEWS IN THE BRASS DEPARTMENT OF THE WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY, PITTSBURG, PA.

The equipment in the scrap department consists, first, of a receiving and sorting department with plenty of magnetic separators and bins for storing each class of metal and each alloy separate from the others. There is a large Schwartz furnace, which is used for converting all brass and bronze scrap into ingots. This material is put on the sampling floor in large quantities and thoroughly quartered down, and, after a careful analysis is made, new metals are added to bring the resultant ingot to a definite analysis. In this way the maximum value is obtained from scrap metals, and they are quickly put into ingot form, so that no loss can occur from scattering or mixing. A check analysis is made on each heat from this furnace, and the heat number stamped on each ingot. The losses have been so carefully determined, and the assays so carefully made that a tabulation and examination of a very large number of check analyses shows only very slight variation



SAND BLAST ROOM IN BRASS FOUNDRY.

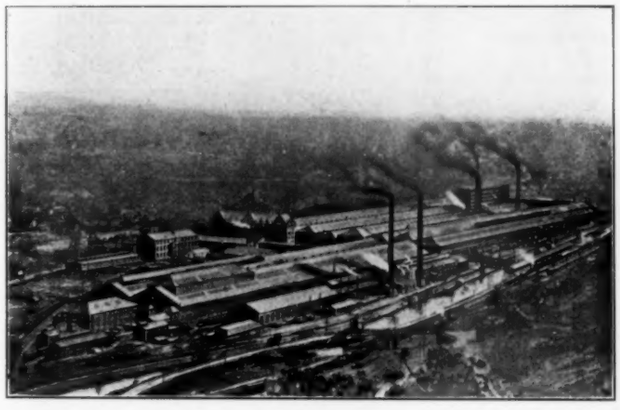
from the specified metal contents. There is also a 20,000 lb. copper furnace, in which all scrap copper from the plant is refined. This copper in its original form is all pure high grade electrolytic copper. When received in the scrap department, it is in the form of clean copper short ends, tinned copper, copper turnings (which may or may not be mixed with iron), insulated copper coils, which have been impregnated with gums and varnishes of all kinds. After removing the iron by means of magnetic separators, this material is all thrown into the furnace and refined into a very high grade casting copper. On account of the entire absence of objectionable impurities, such as are common to the usual brand of copper, no difficulty is found in refining the copper, so that the conductivity is from 98 to 100 per cent. Samples from each heat are drawn to wire for conductivity tests, and, also, a check analysis is made for impurities. The chemical analysis, the conductivity tests, and the fact that the material will draw into small wires is assurance that the material is of the highest grade. A dross furnace or sweating furnace is also provided for recovering lead and tin from

all babbitt and solder scrap and drosses; this combination of lead and tin is carefully refined and thus the maximum value is recovered from all material of this nature. In this same department, are a set of furnaces for making babbitt and solder, where a large number of different solder and babbitt alloys are made.

The entire scrap department is aided constantly by the laboratory, which is prepared to give chemical analyses, physical tests, Brinell hardness tests and all similar classes of information on short notice, as it is absolutely necessary that all such information be easily and promptly obtainable in order to work intelligently. A very considerable amount of copper, brass, and bronze ingots of various alloys is being sold to the trade from this department.

OTHER METAL INDUSTRIES.

But aside from the great production of brass through the various departments of industrial plants in Pittsburg, the city has within its confines, the largest aluminum producing plant in the world in the Aluminum Company of America, with offices in the city, and principal mills at the borough of New Kensington, in the Allegheny Valley, near Pittsburg. The mills produce finished aluminum in almost every known form for the commercial trade, from plates, sheets, wire bars and forms for manufacture into innumerable small articles. Besides this large plant at New Kensington, the company has huge



BIRDSEYE VIEW OF THE WORKS OF THE WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, PITTSBURG, PA.

reduction works at Niagara Falls, N. Y., and Niagara Falls, Canada, and in the St. Lawrence River district.

Then again, the city has the distinction of being the only commercial producer of that great metal alloy, vanadium, and has two plants in the city that practically supply the world with this product. The older plant is located at the small borough of Bridgeville, and the new one which secures its raw material in New Mexico, has a finishing plant in Braddock borough and both companies have offices in the Frick Building in Pittsburg. These are the property of the American Vanadium Company.

The McKenna Brothers Brass Company, of Pittsburg, is one of the older and exclusive brass companies in Western Pennsylvania with a continuous existence of 54 years. It was started in 1857, under the name of A. and J. McKenna, and consisted of a small brass foundry in First avenue. Later, it was changed to A. and T. McKenna, sons of the founder. From this the business fell to the firm of McKenna Brothers, and this firm changed to the corporation of McKenna Brothers Brass Company. The company has a splendid manufacturing building, where it not only carries an unusually large stock of sheet and rod brass, as jobbers, but operates a brass foundry for specialties of its own across the street from the main building. The business of this company extends into all portions of the American continent, its executives being young and energetic men.

The Republic Manufacturing Company with a plant on the North Side is among the newer and vigorous brass manufacturers, commencing with a modern plant on Boquet street, about ten years ago, the first name of the corporation being the Federal Machine Company. With the introduction of the brass business, the company's name was changed. It operates a modern brass foundry, in connection with its machinery plant for manufacturing special machinery. Its specialties are largely brass material for chemical uses and working out brass patterns for inventors.

The Pittsburg Brass Manufacturing Company, with a fine plant in Penn avenue, has a foundry for brass manufacture, employing 12 molders and with five furnaces. It also produces aluminum specialties, for small work, such as patent sweepers and finer machinery. Its brass production is largely for interior ornamental work, and its capacity in brass is 30,000 pounds a month. The business of this company has been growing steadily and its territory is broader each year.

The Pittsburg Gage & Supply Company, one of the most important brass and bronze manufacturers, and also an extensive supply house for machinery and mill supplies, has an extensive plant in Pittsburg, located at Thirtieth street and Liberty avenue. The company's brass and bronze production is one of the important departments of its business, and its trade covers the entire Middle West. The Duquesne Reduction Company, another important element in the non-ferrous metal trade of Pittsburg, with a plant in the Shady Side district, is one of the largest refiners and smelters of residue metals, in the country. Its products are chiefly copper, brass and tin, which it puts on the market in ingots. The plant, when normally active, employs 100 skilled men, and the equipment is regarded as one of the most complete for this kind of work.

The Pittsburg White Metal Company, in the Lawrenceville district, is an extensive producer of lead and babbitt metal for type founders, and its production is extensive, and its business covers a wide territory. Both this company and the Duquesne Reduction Company, are extensive buyers of lead, used in the general processes of the works. The Pittsburg Lamp, Brass & Glass Company, with a modern plant on the North Side of Pittsburg, stands well to the top as a producer of finished brass, which it consumes in the manufacture of finished brass work for lamps and interior decorations. Its business is not confined, however, to the metal industry as it produces art glassware, fine lamps and shades, and has three plants; one in Pittsburg, one at Swissvale, and the third at Jeannette.

Among the subsidiary brass foundries for brass production, the plants located in the great works of the Carnegie Steel Company, and the Jones & Laughlin Steel Company, and the American Sheet & Tin Plate Company are important in their relative part in the general work of those giant industries. The brass production of these plants, however, is for the exclusive use of the mills and forms no special interest to the outside trade. The Pittsburg Valve, Foundry & Construction Company operates a large brass and bronze foundry, supplying its works with brass valves and fixtures for the iron products of the company. The Mesta Machine Company, with one of the largest engine building works in the country, is equipped with an up-to-date brass foundry for supplying brass equipment for the ponderous machines built there.

It is only recently that the announcement was made of the consolidation of the bronze and copper departments of the Best Manufacturing Company, and the Brighton Brass and Bronze Company, of New Brighton, Pa., had been made with the Keystone Bronze Company, of Pittsburg, with an extensive plant at Thirtieth street and Liberty avenue. The Keystone Bronze Company has been extending its works and now will enlarge them more than ever, in order to provide for the new acquisitions. The Best Manufacturing Company by this transaction gives up this department of its business. The Keystone Bronze Company is a producer of copper blast furnace equipment, valves, bearings and other material for iron furnaces.

One of the most interesting and important metal industries of Pittsburg is the C. G. Hussey Company, smelters and producers of copper and brass, with a business that has been in continuous existence since 1843, the pioneer copper smelting concern of Pittsburg, and for that matter, west of the Allegheny Mountains. Dr. C. G. Hussey, the founder of the business, in the year mentioned, became deeply interested in the discovery of rich copper ores in the Lake Superior district. Hearing of the wonderful discoveries there, he secured the first three permits for mining copper in that vast region from the United States Government. He was successful in his mining venture, and in 1843 and 1844, the Pittsburg & Boston Mining Company was formed. Dr. Hussey was a large stockholder and became president of this company, which office he held until the close of the company's career. In 1844, Dr. Hussey made a trip to the then wild regions of the Lake Superior copper field. The first mine in that region was opened by him, known as the Cliff mine. This mine became historic later for its great rich products. In 1846, Dr. Hussey returned to Pittsburg, and the first smelter was built west of the Allegheny Mountains. This smelter was supplied with copper ores from the mines in Lake Superior district. In 1847, a copper rolling mill was built in addition to the smelter, for rolling sheets and bars. This mill was located at Soho, now a congested part of Pittsburg, and while it has steadily grown ever since, the location is almost the same. At the time it was built, however, it was considered far out in the country, on the Monongahela River. This old mill worked up the major portion of the product of the smelter, which amounted to 600,000 pounds annually.

In 1885, the copper rolling mill employed 30 men, and two years later its products amounted to 200,000 pounds of finished copper. This plant is still in operation, but the monthly output of copper exceeds the yearly output of those early times, and today some of the most modern machinery in use for copper working is in service at this famous plant. Today the plant produces every form of finished copper, in sheets, boiler ferrules, and conductor pipe, etc. Dr. Hussey, the founder of the business, has been dead for many years, and today the business is owned entirely by E. H. Binns, with a prosperous trade and a splendid future ahead of it.

The Pittsburg Smelting & Refining Company, one of the most progressive and energetically managed metal industries of Pittsburg, with a modern plant located in Hazlewood district, is devoted to the production of Terne, Babbitt metal and solder, with its chief product of Terne, which is in heavy demand and requiring the full working of its plant to meet the demands. A small brass foundry is attached to the plant also as an auxiliary business. This company is now feeling the boom in the tin plate trade of the country, which directly affects its own business.

The Pennsylvania Smelting Company, of Pittsburg, has a modern smelting plant for the manufacture of desilverized lead, and its trade is mainly localized. The company turns out about 1,200 tons of material annually.

The Damascus Bronze Company, of the North Side, is one of the important brass and bronze industries of Pittsburg, having a finely equipped plant and producing a high-grade brass and bronze material for interior finishing of railroad coaches, and also disposing of brass and bronze in ingot form. The company is doing a fine business and is rapidly spreading out in all directions. Its reputation for fine work has given it a hold on certain lines of business that has been profitable and pleasing.

The Lawrenceville Bronze Company, with a well-equipped plant has been taking a prominent place in the brass and bronze casting trade of the city. Its plant in the Lawrenceville district, which is one of the older industrial sections of Pittsburg, has been in steady operation, and the company's trade has grown encouragingly from the time it was organized.

A foundry plant of no small importance, mentioned briefly elsewhere, is that of the Union Switch & Signal Company, of Pittsburg, with a splendid plant at the small suburb of Swissvale. This company is a Westinghouse concern, and in a detailed description of the plant which the company's officials courteously provided, says:

The foundry comprises the following buildings:

Main building, 180 x 396 ft.	71,280 sq. ft.
Charging floor, 30 x 216 ft.	6,480 sq. ft.
Core makers' and wash room, 30 x 216 ft.	6,480 sq. ft.
Brass foundry, 60 x 126 ft.	7,560 sq. ft.
Total	91,800 sq. ft.

The foundry contains: One 96-inch cupola; one 72-inch cupola; one 66-inch cupola; one positive blower, 48 cu. ft. capacity; One No. 10 blower; two brass furnaces (gas); three crucible brass furnaces; one blower for brass furnaces; one electric separator; molding machines; ten tumbling barrels; one 60-foot 5-ton electric traveling crane; one 30-foot 10-ton electric traveling crane; two sand mixers; core ovens (gas); emery wheels; pickling tanks; paint tank; one exhaust fan; twenty-five Cooper-Hewitt electric lights, direct current, and 1,200 feet of overhead trolley system, 1,000 pounds capacity.

The power for the foundry is about 350 electrical horsepower. Special attention is being paid to the lighting of this building, and for this reason a saw-tooth roof construction was used with a north exposure. Large wall windows are used besides skylights and glass in the roof monitor. The total area of glass amounts to 36,519 sq. ft.

The brass foundry occupies a small portion by itself, 60 x 126 feet, and is separated from the iron foundry by a fire wall. In January, 1911, the company employed in the iron foundry 175 men; in the brass foundry, 20 men. The output during January was 50 tons of iron castings per day, and 2 tons of brass castings.

The following are some of the companies in Pittsburg with brass foundries or other metal producing plants:

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY; capital stock, $54,000,000; general offices and works, East Pittsburg. Chairman, Robert Mather; President, E. F. Aykins; Secretary, W. A. Esselstyn.

WESTINGHOUSE AIR BRAKE COMPANY; capital stock, $14,000,000; general offices and works, Wilmerding, Pa. President, George Westinghouse; vice-president, H. H. Westinghouse; secretary, R. F. Emery.

UNION SWITCH & SIGNAL COMPANY; capital stock, $5,000,000; general offices and works, Swissvale, Pa. President, George Westinghouse; vice-president, H. G. Prout; secretary, James Johnson.

Mesta Machine Company; capital, $2,000,000; general offices, Pittsburg; works, West Homestead. President, George Mesta; secretary, W. D. Rowan.

The Pittsburg Gage & Supply Company; general offices and works, Liberty avenue, Pittsburg. President, W. A. Rodgers; secretary, R. F. Blair; treasurer, R. F. Ramsey.

The C. G. Hussey Company; general plant and offices, Second avenue, Pittsburg. President, E. H. Binns; secretary and treasurer, H. W. Dusenbury.

The Pittsburg Smelting & Refining Company; general works, Hazlewood, district Pittsburg. President, F. H. Good; secretary and treasurer, R. H. Franz.

The Carnegie Steel Company (U. S. Steel Corporation); general offices, Carnegie building, Pittsburg. President, A. C. Dinkey; vice-president, Col. H. P. Bope. Plants in Pittsburg, Braddock, Homestead, Duquesne, Etna, Youngstown, Ohio, and Sharon, Pa.

Jones & Laughlin Steel Company; capital $30,000,000. President, B. F. Jones, Jr.; secretary, W. C. Moreland. General offices, Pittsburg; plants at Pittsburg and Aliquippa, Pa.

Pittsburg Valve Foundry & Construction Company; capital, $1,150,000; general offices and works, Pittsburg. President, J. T. Speer; secretary, S. G. Patterson.

Pittsburg Lamp, Brass & Glass Company; capital, $1,500,000; plant and general offices, Pittsburg, Swissvale and Coraopolis. President, Daniel Taylor; secretary, W. F. McNaugher.

Aluminum Company of America; capital, $3,800,000; general offices and mills, New Kensington, Pa. President and assistant treasurer, A. V. Davis.

American Sheet & Tin Plate Company (owned by U. S. Steel Corporation); general offices, Pittsburg. President, E. W. Pargny; vice-president and general manager, S. A. Davis.

The Pennsylvania Smelting Company; general offices, McChesney building, Pittsburg; plant at Carnegie borough. Producers of desilverized lead exclusively.

The McKenna Brothers Brass Company; general offices and plant, First avenue, Pittsburg. President, W. H. McKenna; vice-president, C. H. McKenna; treasurer, F. F. McKenna; secretary, T. M. McKenna.

The Pittsburg Brass Manufacturing Company; general offices and plant, Penn avenue, Pittsburg. President, Thomas Ward; vice-president, H. A. Beatty; seceretary, H. W. Ward; treasurer, Joseph S. Brown.

The Keystone Bronze Company; plant and offices in Penn avenue; production of brass, bronze and copper castings, tubing, etc.

Chaplin-Fulton Manufacturing Company; plant and offices Penn avenue, near Point; bell founders.

United Engineering & Foundry Company; general offices, Pittsburg; plants in Pennsylvania and Ohio. President, I. W. Frank.

The Best Manufacturing Company; offices and plant, Oakmont, Pa.

The Adams Brothers Manufacturing Company; offices and plant, North Side, Pittsburg.

The Roessing Bronze Company, Etna, Pa.; brass and bronze.

The H. K. Porter Locomotive Works, President, H. K. Porter. Offices and plant, Pittsburg.

The Kelly-Jones Company; general offices, Pittsburg; plant, Greensburg, Pa.

IRON CONTENT OF ZINC.

IRON FOUND IN VARIOUS SAMPLES OF COMMERCIAL ZINC.

	Per cent.	Ratio
Sheet zinc	0.005	1.0
Prime Western spelter	0.008	1.6
Galvanizing pot (3 months running)	0.035	7.0
Zinc rod	0.062	12.4
Galvanizing pot (8 months running)	0.068	13.6
Anode cast from P. W. spelter in iron mold	0.100	20.0
Scale off galvanized sheet	2.420	48.4
Dross (unsweated)	2.590	51.8

Alfred Sang.

THE TRIALS OF A FOREMAN IN A JOB PLATING PLANT.

By August G. Hoffman.

In writing this article, I speak as I have found conditions to exist, and though it may not apply to all cases, I believe it is true of most plants of this kind. As nearly as every plater knows, a job shop is a good place for him to gain experience, but a very poor place for him to exhibit or show his ability after he has gone through "the mill." In the plating department of a manufacturing plant a plater generally has quantity to deal with and assistance that is reliable to a certain extent, whereas in a job shop it is a little of everything, and while he may get a quantity of one class of work for a season, he cannot afford to "fix up" specially for that because the space may be limited, expense may have to be considered, or something or other is generally in the way.

Then again the prices received for the work are generally so close that even a third-rate class of help seems expensive, therefore making it necessary to employ inexperienced help, whom one has to find time to teach as well as to see to the parts of the process through which the work must go and which, of course, are the most important ones. It can be readily understood that just the shade wanted for this, that or the other thing cannot be taught in a short space of time, and it takes long experience to acquire this branch of the art, as well as the importance of this or that detail of the processes, and naturally the faults of the inexperienced falls on the shoulders of the foreman. So if he wants their work to be right he must be continually on the watch, in which case he may as well do it himself; therefore he tries to do most of the work, especially the important processes, and what he accomplishes is generally put to naught in some following process by the inexperienced, which generally means "do it over again."

Most job shops take in all kinds of work, and while one is preparing for one job, another happens along that is wanted "right away," which generally requires different operations entirely; for instance, a plater may be working on gold jewelry, then it is found that some lead work is wanted, and as all jobs must be kept moving it is necessary to have some one else either finish what he is doing or start the other, and both are most important operations, being the beginning and the end. In either case, at the climax it is found that the job is not quite as you wanted and there is not time to do it over, as in disappointing the customer on the time of the job is most as detrimental as poor quality, so the plater naturally feels he will "take a chance," and in most cases where this happens the receiver of the goods proves to be a "crank" on finishes.

These are the general conditions existing in job plating shops, and, if one takes the time to investigate, he will always find those shops lacking either in quality or production on one thing or another, in fact. If one wishes to make profits in a job shop, one must take a chance, and if one desires to produce quality, one must be satisfied with small, if any, profits. Of course there are some well-regulated job shops, where more than one plater is employed under a supervising foreman, in which case each has his special class of work to produce, which alters above-mentioned conditions.

COLORING AND OXIDIZED FINISHES.

In producing oxidized effects upon coffin hardware some consumers prefer the green gray tone. This is produced by using a weak solution of sulphuret of potassium to which is added a little ammonia and used only slightly warm. The articles are immersed without scratch-brushing until the green is produced.

A FEW SUGGESTIONS ON TURRET AND LATHE WORK IN THE MANUFACTURE OF BRASS GOODS.

By E. Dietz.

(Continued from January.)

At times it is necessary to do facing and recessing operations on work, when it is impossible, or inadvisable to perform these operations with tools held in the toolposts of the cut-off slide, or on machines provided with crossfeed of the turret. In these cases the tools shown in Figs. 1, 2 and 3 will be found very convenient, and, in fact, on some operations indispensable. Figs. 1 and 2 show different views of a facing and recessing tool. The body of the fixture, carrying the slide is flanged to the turret, as a more rigid support than the usual round shank is necessary for this tool. It should be accurately machined and the slide should be provided with a gib for adjustment and the taking up of wear at that point.

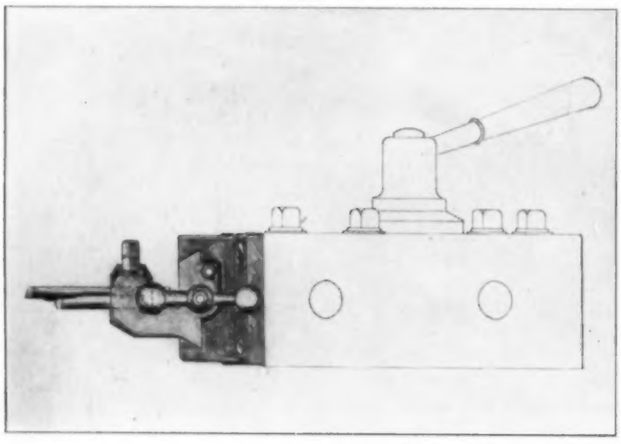


FIG. 1. FACING AND RECESSING ATTACHMENT WITH SCREW FEED.

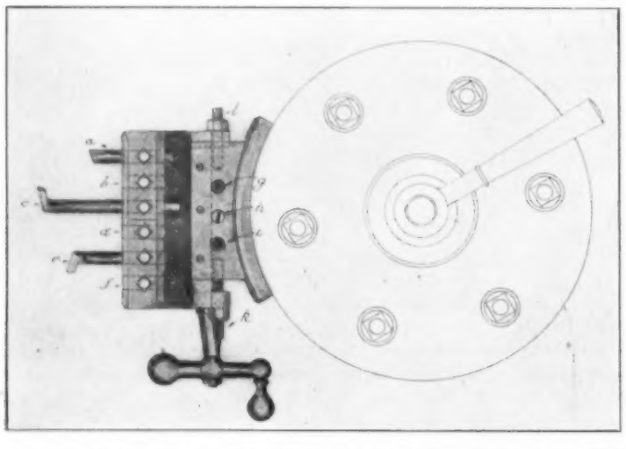


FIG. 2. FACING AND RECESSING ATTACHMENT WITH SCREW FEED.

Six holes, a-b-c-d-e-f, Fig. 1, spaced suitably are divided into the sliding tool block, to receive the cutters or blades. Set screws are provided for holding them in position. The cutters or blades should be of a standard shape of carbon or high speed steel, the size, of course, depending upon the character of the work. It should be noted that the holes a, b and c are located above the center line of the machine in order to bring the cutting edge of the tool in the right position for operating at the back of the work. In using this large number of holes for cutters or blades the range of the tool is increased beyond the limited capacity of the slide, as a number of cutters may be used at the same time operating front and back. Further adjustability is obtained by having three possible positions, g-h-i, of the abutment for the screw stops k and l.

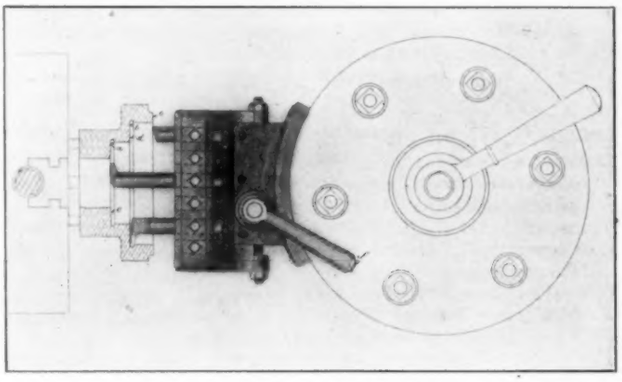


FIG. 3. FACING AND RECESSING ATTACHMENT WITH LEVER FEED.

In Figs. 1 and 2 the tool slide is shown, operated with a screw provided with a small handle. For heavy cuts at low speeds, this method is to be preferred, but on small and medium work, run at higher speeds the type shown in Fig. 3 will be found more convenient. The general construction is the same as that of the tool previously shown, with the exception that it is operated through a rack and pinion by means of the lever shown at f, Fig. 3. An example of what may be accomplished with a tool of this character is shown in the sectional sketch of a casting being operated upon.

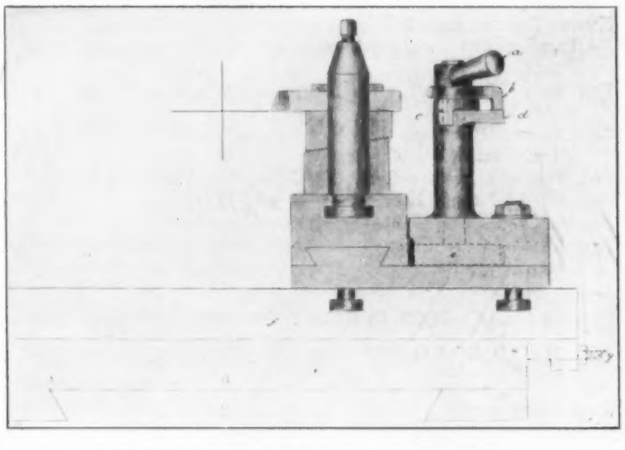


FIG. 4. TAPER TURNING ATTACHMENT.

The two recesses, a and b, and the three faces, c, d, and e, are finished in one operation, three cutters being

used in the tool block. The diameters of the recesses are regulated by the stops k and j. The relative position of the three faces, c, d and e, is maintained by the original setting of the cutters, leaving the turret stop for the general location of the finish. Under the same classification may be considered those tools for turning tapers and irregularly shaped pieces either from the bar or from castings, that employ a secondary tool slide, as distinguished from those using multiblade cutters and forming tools for that purpose.

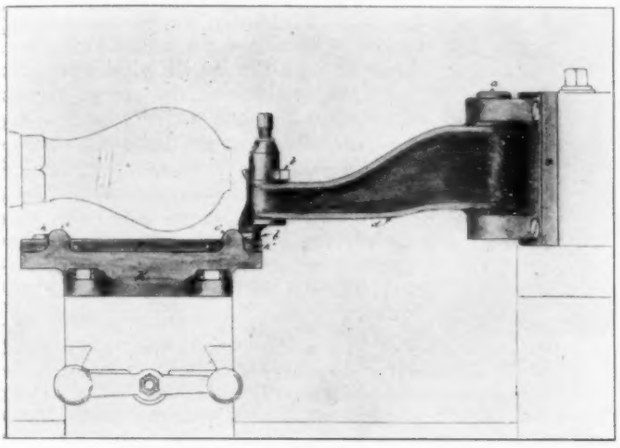


FIG. 5. FORMING ATTACHMENT.

Fig. 4 shows a taper turning attachment with a secondary slide. The attachment carrying the slide with a standard tool post or provided with means for receiving the cutter in a fixed position, is bolted to the cut-off slide at the proper angle to produce the desired taper. The depth of the cut is regulated by the stop of the cut-off slide, longitudinal motion is imparted to the cutter through a rack and pinion, by means of the lever a, Fig. 4. Two adjustable stops, b and c, are

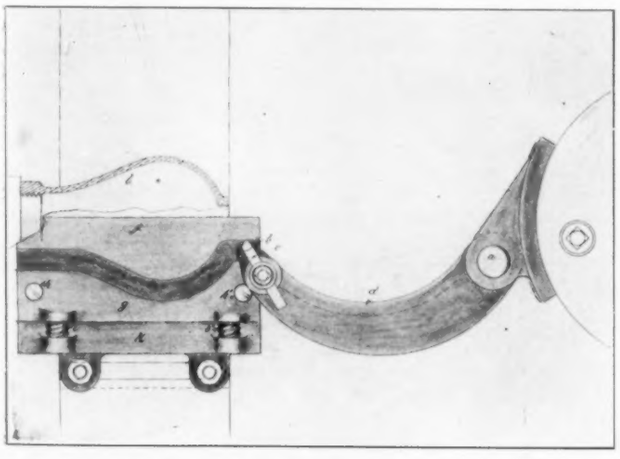


FIG. 6. FORMING ATTACHMENT.

clamped to the pinion shaft. These stops, by striking the stationary abutment d on the main casting, regulate the length of travel of the slide in either division. The general design and construction of this attachment is simple. It is well adapted to a large variety of work requiring taper turning, and will usually be found to meet all requirements, unless the product is manufactured in large enough quantities to justify special machinery.

Figs. 5 and 6 show different views of an attachment designed to turn pieces of a curved outline, such as condensing chambers of lubricators and work of a similar shape. It is particularly intended for work too large to be handled by a single forming tool, and will save considerable time over hand turning in addition to assuring duplication of the finished work.

As will be noted, the arm d, carrying the tool post, and tool C is hinged to the flange c by means of the pin a. An extension of this arm directly under the tool post carries the roller b, which enters and travels in the groove of the former k, which is bolted to the cut-off slide of the machine. This groove is formed by a stationary piece f and a, movable piece g, which is pressed against the roller by means of the springs i and i^1. The shape of the groove determines the outline of the piece being turned. It is important, however, that the center of the roller should at least approximately coincide with the cutting edge of the tool as otherwise the outline of the turned piece will not be a duplicate of the former. As the tool is well supported under the cutting point, quite a heavy cut can be taken without chattering. The depth of the cut is regulated by the stop of the cut-off slide. With a properly ground tool the forward movement of the turret may be used for roughing, utilizing the return for a finishing cut.

(To be continued.)

A BRIGHT ACID DIP FINISH.

A Method for Lamp Burners and Other Brass Goods.

By Charles H. Proctor.

After the articles are all assembled the first operation is to string them on copper wire or arrange them in the regular dipping baskets made from earthen ware or heavy copper wire mesh.

Second: Immerse them in a hot solution of caustic soda or potash, using about one pound to each gallon of water to each gallon of solution. Add about one half ounce of common resin, this assists in removing the oil or grease from the surface of the metal.

Third: Remove after the oil or grease is absorbed, which usually takes from five to ten minutes, then wash in cold water and rinse in hot water.

Fourth: Immerse the articles in yellow aqua fortis 38 per cent. Baumé, for a few seconds. This is termed the firing off or scaling dip.

Fifth: Rinse in cold water, then immerse again in the potash momentarily. Do not rinse in water, but drain well, so that very little of the potash is left upon the surface, then immerse in the bright dip as rapidly as possible. The bright dip should consist as follows to give good results:

Sulphuric acid	2 gals.
Aqua fortis—yellow	2 gals.
Muriatic acid	2 ozs.
Water	2 qts.

After the bright dip wash well in cold water, then pass through a dilute solution of cyanide of potassium. This should consist of 4 ounces of cyanide to each gallon of water. This immersion will remove any acid stains that might possibly show after lacquering. Then dry out by the aid of boiling water, to which is added one ounce of platers compound to each gallon.

Sixth: Dry out by the acid of hot air, maple sawdust or immerse in a lacquer thinner to remove the small amount of water, providing the hot air or sawdust is not used in drying out the articles. If the regular water dip lacquers, furnished by lacquer manufacturers are used the drying out methods can be dispensed with.

PATENT CONTROVERSY OVER BEARING METALS

THE CONTINUATION OF AN INTERESTING DISCUSSION WHICH WAS STARTED BY THE READING OF A PAPER AT THE CINCINNATI CONVENTION OF THE BRASS FOUNDERS' ASSOCIATION, MAY, 1909. TENTH PAPER.

BY G. H. CLAMER.*

In the April number of THE METAL INDUSTRY, Mr. Andrew Allan, Jr., in response to my continued discussion which appeared in the March issue, makes the following statements:

"I still maintain that the art of alloying lead and copper with and without tin was invented by Andrew Allan, Sr., in 1876, and that the results obtainable by this art have not been accomplished by any other metallurgists. My experience has extended over a period of 18 years, devoted exclusively to the manufacture of lead-copper alloys with and without tin, and I can conscientiously state I cannot produce merchantable castings of lead-copper or lead-copper-tin by ordinary foundry practice, nor have I seen such castings containing over 25 per cent. lead produced by others. In my opinion, any foundryman has a legal right to produce lead-copper alloys without and with tin, in any proportion, without or with the use of sulphur."

These statements are made by Mr. Allan, notwithstanding the fact that the evidence as presented in this discussion, is as follows:

1. That the "Allan" metal, prior to placing plastic bronze on the market, was a copper-lead alloy only, all his literature descriptive of the product decrying the use of tin, and making the positive statement that "Allan" metal contains no tin whatever.

2. It has been pointed out that copper-lead alloy and copper-tin-lead alloys are just as different in their properties as other binary and ternary alloys.

3. That in the recent suit for infringement on plastic bronze patents, it was decided by two courts that there is no analogy between copper-lead and copper-lead-tin alloys.

4. Mr. Allan's 18 years' experience has evidently not been of service to him, as I have already quoted in this discussion from testimony of Dr. Albert Sauveur, Professor of Metallurgy at Harvard University, one of the country's ablest metallurgists, but a man absolutely without any practical foundry experience. Dr. Sauveur has testified that he made this alloy by ordinary foundry practice the first time he tried it, i. e., the alloy consisting of 65 per cent. copper, 5 per cent. tin and 30 per cent. lead. In fact, any foundryman who cares to take the trouble to verify the fact that this can be made, can do so by simply melting the metals in these proportions, and casting them in accordance with good foundry practice.

5. The fact that Mr. Allan has not seen castings containing over 25 per cent. lead produced by others, is surely no evidence that such alloys are not made. On the other hand, I can produce proof that millions of pounds of metal made in accordance with the above formula have been manufactured, and can also produce analyses of Railroad Test Departments, which have made inspection and analysis in the regular course of business.

In the last sentence above quoted, Mr. Allan is simply giving his own ideas upon a question which surely is not capable of being answered outside of the courts. Mr. Allan still evades the question, which I have repeatedly put to him, i. e., whether he is in position to prove, beyond a reasonable doubt, that he produced in a commercial way, copper-tin-lead alloys containing less than 7 per cent. tin and more than 20 per cent. lead, balance copper, prior to 1898. Also if he is producing alloys of this kind at present.

*Second Vice Pres. and Secretary, Ajax Metal Company, Philadelphia, Pa.

Regarding the diagram published in connection with my discussion in the March issue, showing the amount of tin which might be present, also amount of lead, without causing lead segregation, and the diagram which Mr. Allan published with his April discussion, showing the amount of tin which should be present with various percentages of lead without showing "lead sweat." In accordance with his interpretation of the patent claims, Mr. Allan has not been sufficiently careful in reading these claims, which I take the liberty of quoting here in full:

"1.—The improvement in the production of copper-tin-lead alloys for BEARINGS, which consists in limiting the proportion of tin to LESS than substantially nine per cent. of the copper in the mix and increasing the lead above twenty per cent. of the mix, whereby upon melting and casting a copper-tin alloy substantially free from slow solidifying combinations of copper and tin results, which alloy when cast sets quickly at a high temperature forming a matrix which holds up ALL the lead, substantially as described.

2.—In the production of copper-tin-lead alloys for bearings, the described improvement which consists in holding all of a high percentage content of mechanically held lead—more than twenty per cent. of the whole mass—by limiting the tin in the copper-tin matrix to BELOW nine per cent. of the copper, in accordance with the existing critical point in the formation of copper-tin alloys, thereby providing a matrix of copper and tin substantially free from slow solidifying combinations of copper and tin and which on cooling solidifies quickly at a high temperature, thus holding up the lead in any desired amount WITHIN THE REQUIREMENTS OF A BEARING and preventing its separation from the copper-tin matrix during cooling, substantially as described."

My readers will please note that it is specifically stated in the claims that the percentage of tin should be less than 9 per cent. of the copper in the mix, and the lead increased above 20 per cent. the object being to produce a matrix which will hold up all the lead. In other words, the patent teaches that tin should be present in any amount less than 9 per cent. of tin to 91 per cent. of copper, which is sufficiently low, so that a matrix is produced from which the lead will not segregate. The low limit of lead claimed in the patent is 20 per cent., and the high limit is that percentage of lead which may be present without causing the alloy to become too soft or yielding for solid bearings. The amount of tin in the matrix for 20 per cent. lead mixture, is 9 per cent. to 91 per cent. copper. This is a safe and practical working alloy, even although a small amount of impurities is present, which the patent calls for.

Mr. Allan has evidently been experimenting, and knows full well that the alloy which he mentions, i. e., 55 per cent. copper, 40 per cent. lead and 5 per cent. tin is impossible of production by ordinary foundry methods. In this alloy the tin is too high for the amount of lead present; furthermore, such an alloy would be of doubtful quality for solid bearings, owing to its inability to resist deformation under pressure. It is, of course, well known, as lead is increased and tin decreased that the rigidity of the alloy is correspondingly decreased, but as I have pointed out, the tin must also be decreased, as the lead is increased in order to produce alloys without lead segregation. The diagram which I submitted with my discussion in the March issue, fully supports the claims of the patent, whereas the diagram submitted by Mr. Allan is not within its teaching.

COSLETTIZING

A New Process For the Rust-Proofing of Iron and Steel.

By Emmanuel Blassett, Jr.*.

Coslettizing is a name applied to a new chemical process for rust-proofing iron and steel. It is the invention of Thomas W. Coslett, an analytical chemist of Birmingham, England. The process has been patented in England, the United States, France and Germany. (British patent No. 8,667, of 1906, and United States patent No. 870,937—granted in 1907.) Beyond doubt this process produces the most rust-resisting finish for iron or steel, by simple immersion in solution, that has yet been discovered. It is equally as resistant to corrosion as the Bower-Barff process and has the greater advantage of being extremely economical to produce and simple to manipulate. The process is the result of several years of patient research and experimenting with the view of perfecting a finish that would withstand ordinary friction and be impervious to the oxidizing influences of the atmosphere. Mr. Coslett's labors were crowned with success, and the process he has discovered is, apparently, destined to revolutionize the art of metal finishing, and is of great commercial importance and scientific interest. The technical press of England has generally acknowledged this fact. It was perfected and first used by Mr. Coslett in Birmingham, England, in 1906. The usefulness and importance of the process was quickly acknowledged, and there are now many firms throughout England, France, Belgium and Germany, where it is constantly employed.

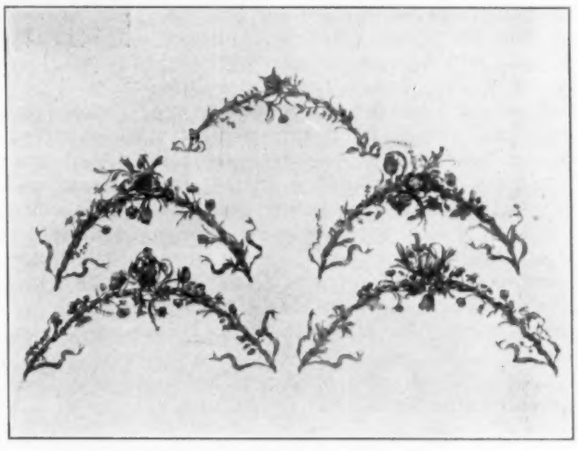


EMANUEL BLASSETT, JR.

The formula for producing this finish consists simply of a dilute solution of phosphoric acid and iron filings, kept heated to the boiling point. The solution is contained in wrought iron tanks and heated by means of a Bunsen burner or steam pipes. In England the vats are encased in brick work, and having a furnace may be fired from the exterior of the building. By this arrangement any kind of fuel may be used. A convenient method for small solutions is to use an enamel or iron kettle placed in boiling water. A wooden tank may be used to hold the water, and a steam pipe allowed to drip therein. This method is a little slower, but more simple and economical to arrange. In addition to the formula the licensees of the process are given a chemical test which indicates the condition of the solution and the proper density to maintain it.

The technical details for producing this finish are extremely simple, and good results are produced at all times. The work to be finished is first immersed for a few seconds in a boiling solution of potash or caustic soda, and if rusty or greatly tarnished is put through the ordinary sulphuric acid pickling solution. It is then rinsed in water and placed immediately in the Coslettizing solution. The work is suspended on iron wire or hooks, and small articles, such as screws or nails are placed in an iron or earthenware basket. The solution must be kept at the boiling point and the work allowed to remain in it for 2½ to 3 hours. When the work is taken from the bath it has a greenish-black appearance. It is allowed to dry, when it may be oiled with linseed oil or paraffin oil, when it assumes a pleasing gray-black color.

To produce the best results the article is preferably scratch brushed on a soft iron wire brush revolving at about 800 revolutions per minute. The linseed oil being a heavier oil than paraffin will enhance the beauty and wearing qualities of the finish. Many, however, prefer the use of paraffin oil, which is less sticky and susceptible on the finished article. By this process the surface of the iron or steel becomes changed to a permanent phosphatic condition which renders the metal highly immune from the corrosive action of the air. While mostly all other processes simply coat the article, this finish enters into the composition of the metal, producing a homogeneous surface that is impossible to strip and is not easily removed. Mr. M. Thornton Murray, B. Sc., in a lecture delivered to the Birmingham University Metallurgical Society, stated of this finish: "The surface of the iron is converted into a mixture of the ferrous and ferric phosphates and presents a pleasing dull black appearance. The process makes the iron highly resistant to corrosion and is being applied to cycle frames, gun barrels, stamps and press work."



ART IRON WORK "COSLETTIZED."

A comparison of this process with the Bower-Barff finish and other methods which are now used for producing the black oxide of iron will show the superiority of Mr. Coslett's invention. The Bower-Barff finish, which is produced by using excessive heat and forming the black oxide of iron is apt to be scaly, and, of course, is unfit to use on edge tools. It is, furthermore, expensive to produce, and its application is limited.

The Coslettizing process will not destroy the temper or other attributes of steel and the most delicate springs retain their original resilience.

The finish is employed in England on steel and iron of many varieties too numerous to mention here. A few are: cycle and automobile parts, scientific instruments, electrical fittings, railway carriage trimmings, gun barrels

*Foreman Plater, Bridgeport, Conn.

and small arms of every description. It is interesting to note that the finish is used on submarine parts furnished for the admiralty, and also for finishing the wire and steel trimmings of flying machines. It may be used with great advantage on general hardware, which is now finished with the black oxide of iron. A few of the many articles to which it may be applied are: carpenter's squares and bit braces, chisels, dividers and pliers. It is an exceedingly useful finish for steel drills of all description, keeping the drill in excellent condition while it is in stock.

One of the most important uses of this finish is for coating iron and steel articles before japanning or enameling. Cycle and automobile parts treated in this manner are extremely resistant to corrosion in torrid climates. The surface takes the enamel or japan to perfection. It is the intention of Mr. A. E. Flavell, of Coventry, England, who is introducing the finish in the United States to start a small plant for finishing samples in the immediate future. Mr. Flavell's headquarters are at present at the King Edward Hotel, New York City.

This finish is used at present in this country on saddlery hardware and several typewriter firms are contemplating the use of it. The field for this process is limitless, and the finish will be extensively used in the future to replace some of the more expensive and laborious processes of the present.

A NEW TYPE OF ELECTRIC FURNACE*

By Carl Hering.†



CARL HERING.

In ancient times when war and conquest were the chief occupations of man and were the chief goal in life, it was customary to make slaves of the captured enemy. While this is not a good moral principle to be recommended when our fellow men are the victims, yet it may sometimes be a good principle to adopt in dealing with inanimate things and forces. If, for instance, our goals in a problem are seriously interfered with by unexpected opposing forces or exasperating phenomena, it may sometimes be possible and profitable, particularly if these new forces are formidable, to make a slave of such an enemy and make it do our bidding.

Some years ago an electric furnace project which was being developed by the writer, was a complete failure because a heretofore unknown or unrecognized force manifested itself unexpectedly, which acted to locally contract the cross section of the liquid resistor through which the electric current was passing and in which the heat was being generated; this contraction or pinching frequently resulting in complete rupture thereby limited the temperature which could be generated, and on account of the appearance which it gives the conductor, the writer gave it the name "pinch phenomenon," by which it has since become generally known. This electro-magnetic force acts from the circumference to the center of the conductor, and in a direction perpendicular to the axis.

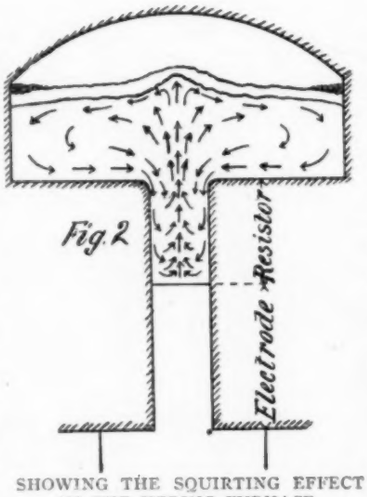
As this new and unexpected force was found to be quite formidable in amount, the writer, some years ago, prompted by a desire to make this exasperating enemy his slave, devised the following method to put this force to good use.

Let the circle, Fig. 1, represent the cross section of a cylindrical conductor; these forces will then tend to act radially as shown by the arrows. If now the conductor be made to be a vertical column of liquid as, for instance, the part marked "resistor" in Fig. 2 consisting of a hole in a non-conducting material closed at the bottom by the electrode and filled with the liquid, then these forces will act horizontally and perpendicularly to the axis along the whole length.

If the text books were correct in saying "like currents attract," the mutual attraction of the parallel elemental currents in such a conductor, which produce this radial force, would simply increase the current density in the center. But as the writer has repeatedly pointed out, this attracting force acts not on the currents per se, but on the material constituting the conductor, and for this reason it is the liquid particles constituting this cylindrical conductor, and not merely the currents, which should be moved bodily from the circumference to the central axis; hence they should create a suction near the periphery and a pressure at the center.

Moreover, by hydraulic action these radial forces should in turn produce corresponding longitudinal forces at the center and at the periphery, and as these axial or vertical forces cannot expand themselves at the bottom, they should do so at the top, thereby producing a veritable fountain, as shown in Fig. 2, the liquid flowing up in the center and down at the periphery, about as shown by the arrows; moreover, the direction of this hydraulic flow is independent of the direction of the electric current, hence is the same for direct or alternating currents. This fountain or squirting action was therefore a prediction by theory; a subsequent test showed that the prediction and hence the theory was correct; the forces and the consequent squirting action turned out to be even considerably stronger than was hoped for. It in fact constitutes a true valveless, electromagnetic pump.





SHOWING THE SQUIRTING EFFECT IN THE HERING FURNACE.

*From a paper read at New York meeting American Electro Chemical Society, April 6-8, 1911.

†Consulting Electrical Engineer, Philadelphia, Pa.

It will readily be seen that this new phenomenon, which was colloquially named the "squirt phenomenon," is admirably adapted to be made the basis of a liquid resistor furnace. If such a column is made the resistor in which the heat is generated by passing the current through it by means of an electrode at the bottom, the heated liquid will be expelled and forced to the top against the blanket of slag, while the cooler liquid at the bottom will be sucked down into the hole near the circumference to be in turn heated and immediately expelled with considerable force. With energetic circulation through the resistors, the fatal objection to the use of liquid resistors could be overcome.

In practice one would naturally use two holes, one for each electrode, as that reduces the depth of the hole to one half. The proportions of the hole, that is, the ratio of the section to the length, are of course determined by the resistivity of the material, the amount of heat to be generatel, and the relation of the volts to the amperes; the actual dimensions are therefore still a matter of choice. The ejecting force, or "squirting force," increases with the square of the current and diminishes as the cross section increases. It will be seen, therefore, that there is, very fortunately, some choice left as to the dimensions of these "flowing resistors," as they might appropriately be called. In most materials there is apparently a very rapid rise of resistivity with the temperature, which is very favorable to the proportions of such resistors, as is also the apparently very rapid increase of the specific heat of iron at the higher temperatures.

The advantages of a furnace based on this principle are numerous. It is ideally simple and cheap, consisting merely of a crucible or hearth with two suitable holes in the bottom plugged with the electrodes. The heat is generated in the material itself, which is just where it is wanted; moreover, it is generated in the most rational place, namely, at the bottom and not on the top surface; it is conveyed and distributed mechanically, so to speak, throughout the melted mass, and this conveyance of heat is immensely more rapid than it would be by mere conduction or by the slow flow due to differences of density; hence a charge is treated and finished rapidly, whereby the output of the furnaces per day is increased and the losses of heat per ton are proportionately reduced. As far as is known now, there is no temperature limit except that of the failure of the refractory lining, as the pinch effect can no longer limit the temperature.

This very active agitation and circulation of the liquid mixes the product rapidly with any of the refining ingredients which may be added, and tends to make the product very homogeneous. Every particle of the liquid is in turn, and repeatedly, brought to the surface, where mechanically suspended impurities and gas bubbles are expelled and forced into the slag, and where the metal is exposed to the chemical action of the slag, which is so desirable and important in the refining of steel; the fresh and highly heated surfaces thus exposed to slag action are, of course, enormously greater than in a still bath. The top surface of the metal may, of course, be made as large as one desires. The temperature at the surface of contact of metal and slag, on which temperature the slag action depends, is certainly maintained better when the heat flows up naturally from the hot metal to the cooler slag, than when it is forced to flow down unnaturally, from the hotter slag to the cooler metal; aside from the fact that heat in liquids generally prefers to rise than to be carried down, there would in the latter case necessarily be formed a layer of cooler slag in direct contact with the metal, and even if quite thin, this would undoubtedly act as a blanket of high thermal resistance, necessitating heating the slag to very high temperature in order to force the heat through this resisting layer with the desired rapidity.

Other advantages besides this lie in the fact that the electrodes are very cheap, are not consumed, and as they may be made of metal they are far more economical in energy loss than carbon or graphite would be. No moving and adjusting of the electrodes are required. The interior of the furnace may be made as small as the quantity of material to be held, requires, hence the thermal efficiency of the walls of such a furnace could no doubt, if desired, be made to reach the practical maximum of all types of furnaces. Moreover, as the heat is rapidly distributed mechanically throughout the mass, the maximum temperature need be no higher than that required for the desired metallurgical or chemical action, hence the heat losses, which increase so rapidly with the temperature, are correspondingly reduced; in this there is a great advantage over arc furnaces, in which the temperature is necessarily that of the vapor of carbon, hence immensely higher than what is needed.

The regulation is simple, rapid, and, in fact, ideal; the resistance does not change appreciably with varying amounts of metal in the hearth; the resistance of the resistor, as determined by the voltage and amperage, may perhaps, in some cases, be an indication of the progress of the metallurgical treatment; and, owing to the very rapid circulation, one can feel sure that the treatment is uniform throughout the whole mass.

There is an interesting feature in the fact that when the electrode is made of the same diameter and material as the resistor, the furnace should tend to become self-regulating as to temperature. When, for instance, the temperature becomes higher, the electrode automatically becomes longer, and the resistor therefore shorter, whereby less heat will be generated; and the reverse when the temperature becomes lower. The place where the electrode ends and the register begins is, of course, that section across which no heat flows; the heat generated below this section flows out to the terminal, and that generated above it flows into the furnace; it is this plane that automatically moves up or down.

The hottest liquid is that in the center of the resistors, and is therefore not in direct contact with the refractory lining. The friction of liquid against liquid, in the interior of the conductor, is far less than might be supposed, provided the liquid is in a very fluid state. The rapid flow is not along the walls of the hole, but in the center, where it, of course, causes no wear. Whatever friction there is, converts the mechanical energy into heat, and is, therefore, not lost. The counter e. m. f., which must necessarily be generated by the movement produced, is an advantage, as it shortens the resistor, and the energy corresponding to this counter e. m. f., of course, also ultimately generates heat by friction, and is therefore recovered. Some of the electrical energy is therefore converted first into motion and then into heat; the greater this part the better.

By using a bath of some suitable metal in the bottom of the furnace as the prime receiver of the heat, the furnace is adapted to be used to melt non-conductors like glass, or heat granular ores, reduce and volatilize such metals as zinc and arsenic from their ores, etc.

By dissolving carbon in the iron in one part of a bath and the oxide in another part, iron can be reduced from its ores, and the CO gas produced can be burned to preheat the ore, whereby the total energy of the carbon may be utilized; notwithstanding the fact that an authority recently said this was theoretically impossible.

The power factor can, of course, be made very high, probably practically unity, and unlike in the induction furnace the frequency need not be abnormally low.

The squirting action operated very satisfactorily the very first time it was tried in a furnace. Even a moderate pinch pressure was found to produce a very active circulation, probably more than ample for most purposes. The top surface of the metal shows two little agitated hills with two or four low points between them constituting whirlpools, in which the coating dirt all collects. The action resembles the rapid boiling of water when the heat is concentrated at two spots, except that there are no gases formed, and it is therefore quite noiseless.

When badly proportioned the columns are apt to pinch off, causing rapid "makes and breaks"; this so greatly reduces the amount of heat which can be generated, that there is danger of freezing. Such repeated breaking of the circuit should by all means be avoided. Several times a charge was left to freeze in the furnace over night, and yet was readily started the next day from the cold state, thus showing that the resistors do not part in shrinking.

An interesting feature of the principle on which this type of furnace is based is that, contrary to the more usual cases, the larger the furnace the better, and the less will be the difficulties, because the resistors then become shorter and thicker. The principle does not lend itself so well in this form to small furnaces, as the resistors then tend to become long and thin; there are, however, modifications to be used in such cases, which need not be considered now. This new principle naturally opens up a new field, and there are, of course, many modifications which at once suggest themselves, which will be tried in due course. It would be quite simple, for instance, to add gaseous fuel heat, or the heat of an arc, in the upper part; or to add the electrical parts to existing open hearth or other furnaces, and use the electric heat only for the final treatment.

The transformer is best attached directly to the bottom or side of the furnace, as the furnace currents are, of course, of low voltage, hence large in amperes. The flexible connections to a tilting furnace, then, consist merely of the two thin primary wires. The furnace is readily adapted to three-phase currents; the only change is that there will be three holes and electrodes instead of two. This is an advantage because, for the same current in each electrode it shortens the resistors by one-third. A two-phase current may be readily transformed into one of three phases by means of a Scott transformer.

Under all conditions there should always be reached a stable state of temperature in the resistors, at which the heat generated in them is equal to that carried out of them mechanically; the best conditions must be determined by practice; fortunately there is a considerable range of latitudes in the proportions which could be chosen. The following is a list of some of the objectionable, troublesome or undesirable features of arc, induction, and simple resistance furnaces with liquid resistors, and it will be seen that they would all be avoided entirely or at least lessened, in the present type of furnace.

Among the disadvantages of arc furnaces may be mentioned the following: The handling, feeding and adjusting of the electrodes; their cost, because they are consumed; the breaking off of their ends in the furnace; the handling of the hot stubs; the difficulty and expense of making good connections with the terminals outside of the furnace, through which terminals the electrode must be capable of being moved; the water cooling of these movable terminals above the furnace hence the possible danger of water running into the furnace; the wasting away of the electrodes on their sides; the contamination of the product by the material of the electrodes, which cannot be of metal; the carbonaceous atmosphere; the unnecessarily high temperatures, and the consequent additional losses through the electrodes and the roof of the furnace; the unnecessarily large inside volume of the furnace, which increases the losses, the heat is applied at the top, hence travels down chiefly by very slow conduction; aided somewhat by a local agitation immediately under the arc; there is therefore no gravity circulation, hence the distribution of the heat is necessarily very slow and uneven; the heat must pass through the slag, which is a bad conductor, to the metal, which is a good conductor, instead of the reverse, which would be more rational; hence the heat convection to the metal is necessarily slow; this means greater loss of heat per pound of product, and a larger furnace; complications arising when three-phase currents are used; the difficulty in regulating the current of an arc, and the cost of apparatus for doing so; the troubles when the arc goes out; the attention required to prevent this; an arc furnace cannot well be used for zinc, arsenic, glass, etc.

Among the disadvantages of induction furnaces may be mentioned the following: The cost; the bad power factor, and necessarily poor transformer; the necessarily poor heat insulation; it must be dismantled to start cold; the necessity of retaining a large part of the charge for starting the next run, or it must be started with a relatively large part of the charge heated elsewhere; the limitation of temperature by the construction and by the pinch phenomenon; the maximum temperature may therefore not be high enough for some purposes, as, for instance, for the melting of aluminum; all of the charge conducts the current, hence the charges must be small or the possible variations of the current very great; unequal heating when not perfectly level; no very active longitudinal circulation, hence the chemical actions are slow, involving a smaller output per day, and therefore a greater heat loss per pound; no large, open space for slag action, except by introducing complications; these require additional current to be introduced by means of electrodes, and the difficulties then arise of getting rapid circulation, as well as some of the other troubles of electrode resistance furnaces which it was the very purpose of the electrodeless induction furnace to eliminate; expensive complications when three-phase currents are used; apparently not applicable or practicable for ferro-alloys, zinc, glass, ore reduction, etc.; the difficulty of good insulation of the high-tension current.

Among the disadvantages of resistance furnaces having electrodes and containing fused material, may be mentioned the following: Serious limit of temperature and speed of heating due to pinch effect; contamination of the product by the material of the electrode if carbon or graphite; great changes of current required with increasing quantities of reduced materials.

THE HERING FURNACE

A Discussion of the Merits of the New Furnace.

By G. H. Clamer.*

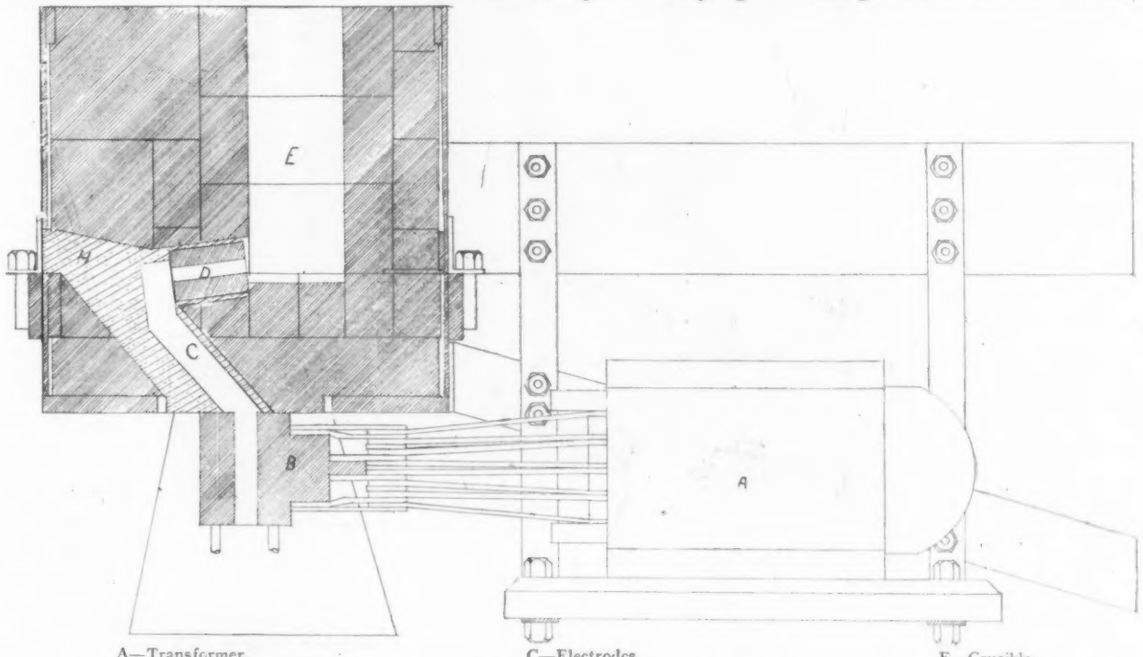
As you have published in this issue a reprint of Mr. Hering's recent paper on his new type of electric furnace, it will perhaps be of interest to your readers to have a little more detailed idea of the practical application of this invention.

The apparatus shown on the accompanying sketch was designed to test the phenomenon which Mr. Hering has discovered, and which is applicable for electric furnace construction. The apparatus shown was all gotten together from scrap material, which we happened to have about our works, and we used a transformer, not designed for carrying out this work, but still sufficiently near our requirements to be used successfully.

"A" on the drawing indicates the transformer. This transformer is connected with single phase current 220 volts, and transformed into current of approximately 5 volts. It is of 30 kw. capacity. The transformer, as will be seen, is supported on structural shapes, so that it can be directly connected to the electrode "C" by means of the iron block "B," through which a stream of water passes, thus keeping the end of the electrode cool. The electrode "C" is directly connected with resistor tube "D.' The electrode is so proportioned that there is a minimum of heat loss through it, and the resistor "D" is so proportioned that a current of high-current density passes through the metal contained therein. This resistor tube discharges directly into the crucible "E," in which the metal is charged. "H" represents the packing around the electrodes and resistor tubes, which prevents the furnace from leaking.

There are, of course, two resistor tubes and two electrodes in such a furnace, and in order to start it, it is necessary to have metal in the resistor tubes and make a metallic connection across the ends of the tubes. This can be done either by pouring liquid metal into the furnace in order to cover the tubes and make electrical contact with the electrode "C," or it can be started by attaching a cold rod of practically the diameter of the resistor tubes to the electrode, and making the connection outside of the tubes, either by solid rod or by liquid metal. The action of the current when turned on, therefore, is to melt the metal in the resistor tubes and the metal outside connected with them, thus starting the melting operation. As soon as the metal has become melted, the pinch phenomenon exerts itself, and the metal is squirted through the center of the tube, and the cold metal runs in at the sides. The furnace is now ready for continuous melting.

No attempt has been made in the construction of this furnace to give it the proper heat insulation, and although it is still too early to give any figures on the cost of melting by this means, it is hardly to be hoped that for melting non-ferrous metals, it will successfully compete with fuel in cost where steam power is used, but it is quite possible that benefits will be derived which will offset this increased cost, i. e., the metal is melted entirely out of contact with any fuel gases, and can be thoroughly protected from oxidation. Then, again, the mixing action in the furnace, due to the "pinch" effect, is so thorough that no doubt superior alloying or mixing results will be obtained, as well as very much less shrinkage of the metal, and the production of a greater percentage of good castings.



A—Transformer.
B—Water Jacketed Blocks.
C—Electrodes.
D—Resistor.
E—Crucible.
H—Packing.

PLAN OF THE HERING FURNACE.

You are perhaps familiar with the progress which has been made in connection with steel refining in electric furnaces, this process now being on a firmly established basis. The "Hering" furnace possesses features for steel refining which makes it very much superior to the existing types of furnaces, i. e., it uses no consumable electrodes, heats from the bottom, bath is kept in continuous agitation, thus reducing the time of refining, due to bringing every particle of the metal into contact with the slag repeatedly by automatic

*2nd Vice Pres. and Sec'y. Ajax Metal Co., Phila., Pa.

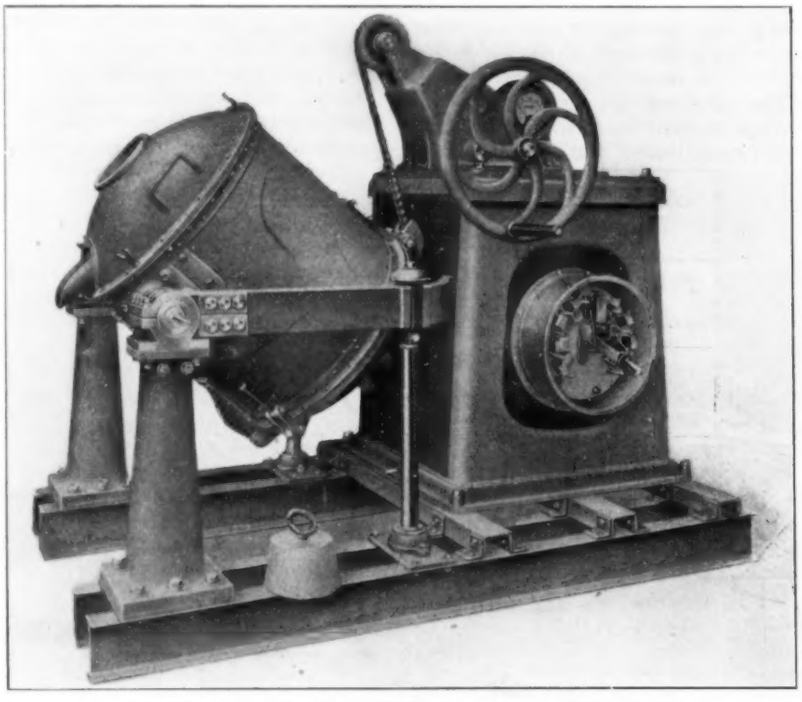
action. This furnace also has decided advantages over other types of furnaces for certain ore reductions, etc., which will be gone into later. We are at present engaged in designing a furnace of 3,000 lbs. capacity for steel melting and refining, which will shortly be in operation. There is practically no limit to the size of the furnaces which can be constructed to operate upon the "Hering" principle, as a matter of fact, a furnace of fifty tons' capacity would be far more economical than a furnace of one-ton capacity.

Furthermore, the furnace can be combined with oil or gas-fired furnaces, and as it is a well-known fact that the lower range of temperatures can be obtained more cheaply by fuel heating, and the higher temperatures by electrical heating, a combination of the two for melting high-melting-point products, such as steel, ferro-alloys, nickel, etc., wil result in melting economy, even when the current is generated by steam power, aside from other well understood advantages which are derived from electrical heating.

THE HELLBERGER FURNACE

A New Electric Transformer Crucible Furnace for Melting Metals.

In view of the fact that practically all the progress in electric metal melting furnaces has been in the direction of iron and steel, the Hellberger electric transformer furnace, which has recently been put upon the market, takes on added interest. The furnace shown in the accompanying illustration is manufactured in various sizes by Hugo Hellberger, Munich, Germany, and is a novel type of electric furnace for melting metals using ordinary graphite crucibles. This furnace covers a wide range in that it will melt anything from materials of the lowest fusible point up to the most refractory, such as platinum and the silica compounds. In fact, the manufacturers claim that the furnace is particularly designed for the melting of brass, copper, tin, lead, zinc, iron and steel, gold, silver, and platinum under the most economical conditions.



THE HELLBERGER ELECTRIC TILTING CRUCIBLE METAL MELTING FURNACE.

The furnace operates on the principle of electrical resistance, which, of course, is not new, but by means of the good construction, the ability for absolute control of work and temperature, the absence of radiated heat, smoke or soot, and the fact that the melting metal can be seen at all times renders the furnace so the makers claim, one of the most perfect of its type so far invented. The construction of the furnace is of two separate and distinct parts. The transformer for transforming the voltage of the electric current is situated at the back, and to control the melting operation there is provided an ammeter and regulating switch which are placed at the top of the transforming apparatus. Overheating is obviated completely, for by the use of the regulating switch and ammeter the heat of the metal is perfectly regulated. Inside the jacket shown in the cut there is a water cooled pedestal upon which the crucible is placed. The crucible is surrounded with a jacket of fire clay so constructed that it can be easily removed. This jacket serves to prevent the loss of heat by radiation. A connection plate is clamped by means of a screw and hand device, which are not shown in the cut, to the top of the crucible, after it has been filled with metal, and the furnace is then ready for melting. A weak current is used at first, and after the crucible becomes red hot the current is increased so that melting begins.

Based on the above results the cost of melting, figuring the electric current at one cent per kilowatt hour, is shown to be 0.17 cents per pound of copper. Anyone knowing the cost of his electric current at his particular plant, can easily calculate the cost for melting his metal. For melting precious metals the following results were obtained: One kilo (2.2 pounds) of pure platinum required 10¼ kilowatt hours, and one kilo of 14-k. gold required ½ kilowatt hour. It will be seen from the above description that the Hellberger furnace is designed to take a very important place in the melting of metals where electricity is obtainable at a reasonable cost and the various advantages claimed for the furnace (which claims have been substantiated in practice), would seem to make the furnace a very attractive proposition, particularly for melting of precious metals, in small quantities.

The melting operation can always be seen when filling or stirring because the clamping arrangement touches the crucible only on the edge. Any additions in the way of making special mixtures can be done while the furnace is in operation without changing the heat or the position of the crucible. Some results giving the cost of running the furnace have been published and show that the actual expense can be kept down to a very low basis.



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THE METAL INDUSTRY

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THE ELECTRO-PLATERS' REVIEW, COPPER AND BRASS

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PALMER H. LANGDON - - - - - - - - Editor and Publisher
LOUIS J. KROM - - - - - - - - - - Managing Editor
GEORGE W. COOPER - - - - - - - - - Advertising Manager
THOMAS A. TRUMBOUR - - - - - - - - - - - Cashier

ADDRESS ALL CORRESPONDENCE TO
THE METAL INDUSTRY, 99 JOHN STREET, NEW YORK
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INDUSTRIAL ALCHEMY

The recent address of William H. Walker, Professor of Industrial Chemistry, Massachusetts Institute of Technology, at the Congress of Technology, held in Boston last month, is so timely and so full of common sense reasoning that we are compelled to notice it. We publish here a short abstract from the address, and trust that our readers will find it as interesting as we do.

Professor Walker said: "There is a heavy moral obligation on the part of large industrial organizations having fully equipped research laboratories to contribute their share to the advance of the world's knowledge. They have well stocked libraries, and are provided with all the current periodicals; they profit by all the scientific work which has been done and is being done. This is as it should be, and such firms are to be commended for their progressiveness. But is this not a reason why such laboratories should do their part in adding to the sum of available knowledge? There is in every laboratory much work which could be published and yet conserve the interests of the corporation. First, there are the results which may not have proved valuable to the laboratory in which they were obtained, but which would be of immense value to someone else working in an entirely different field. Second, there are those results of value to the laboratory possessing them, but which could be published in an unapplied or "pure" form and which would make an important contribution to science, and at the same time the publication would work no injury to the company or corporation most interested. And finally there are those results of operations and processes, machines and apparatus which, if the truth were known, are possessed by a number of concerns, but are held as valuable secrets by each. Everyone would profit and no one be the loser by so far-sighted and generous a policy.

"Germany is very justly held up before us as a shining example of marvelous industrial progress and prosperity. A very great deal of the credit for her present position is due to her splendid educational system. But no small factor in her national progress is the helpful attitude which her industrial organizations take toward the publicity of scientific data. The individual does not suffer, while Germany both from a purely scientific and an industrial standpoint is rapidly advanced. But too often with us the president and his board of directors are alchemists; they fail to see why if they pay the salaries of their research men, they should give to the public, or their competitors, any part of their results. They exclaim, 'What has posterity done for me?' They would have their laboratories remain the secret chambers of the alchemists, and continue to improve their methods of changing baser materials into gold without regard to the obligations which they owe to their fellows.

"It requires no extensive mathematical calculation to prove that the manufacturers themselves would be the ones to profit by such a liberal treatment of the results of scientific work. Of one hundred manufacturing concerns, each one would give but one per cent. to the whole contribution, while he would receive the remaining 99 per cent. He could not in the long run be the loser. But of vastly more importance, he would feel and know that his organization was taking part in a world movement toward that increase of human knowledge upon which all real progress depends."

One of the very best mediums for helping to overcome commercial secrecy is the scientific society. The spirit of good feeling and broadmindedness engendered by membership in one of these societies will do

more good in enlightening the world on the progress of scientific industry than anything else we know of. The volumes of proceedings which are published year after year by our prominent scientific societies are a veritable encyclopaedia of knowledge relating to all industrial subjects.

The metals industry had been somewhat neglected both at home and abroad until within a few years ago, when, with the formation of the American Brass Founders' Association, and latterly The Institute of Metals of London, England, and the National Electro-Platers' Association, matters have taken a slightly different turn. Secretive and phlegmatic foundrymen and taciturn platers are waking up on all sides, and are thirstily seeking for knowledge. Large concerns which have carried on expensive and exhaustive research work of an industrial character are letting down the bars and giving the benefit of their results to the world. In some cases these results have been of value not only to others, but also to the investigator himself. A case in point is the paper on "The Adhesion of Electro-Deposited Silver," the beginning of which was published in the April issue of THE METAL INDUSTRY. This paper gives results of experiments made on silver-plated German silverware, and points out the causes and remedies suggested for inferior work. If it had not been for the existence of the Institute of Metals, before which the paper was first read, we doubt if this paper would ever have been presented to the public eye.

Another important factor in this latter-day industrial expansion campaign is the holding each year of meetings and conventions of the various societies. Here again is offered an inducement for science and practice to come together and compare notes. The theoretical man is invited to express his views and opinions and the practical worker is urged to discuss the problems that arise and give his experiences of actual occurrences. No better way can be devised for lifting the veil of mystery surrounding some supposed secret, which upon being discussed in the light of reason, proves often to be to some an old friend in new garb.

The most important of these conventions, to the metal trade, at any rate, takes place in Pittsburg, Pa., May 23 to June 1 of the present year. At this convention, the progress of preparations for which has been chronicled each month in the columns of THE METAL INDUSTRY (see the first pages of this issue), will be a momentous affair. The list of papers promised by the literary part of the programme certainly indicate a wide-open policy on the part of the authors contributing. Men who have spent considerable time and more energy in working out the details of the practices described in these papers, now give the same freely to be added to existing literature. The discussions on these papers promise to be intensely interesting, and no one can fail to get something of value even by being a rank listener. Taking this convention all in all, it offers a wide field for information, and no one connected with the metal trades should miss the opportunity to mingle with his fellow workmen, and have his puzzling problems solved or help to solve those of others.

The trade journal, too, plays its part in the educational schedule; keenly alive to the value of publicity it gathers the meat from the nut of general news and dishes it up in palatable shape for the busy reader. Every new process, machine or business operation is carefully investigated and faithfully reported in clear, concise style in the endeavor to keep the interested one posted on the progress of his chosen industry. We have heard men say that they would rather go without breakfast than without their trade journal; all of which goes to prove that the trade journal fills a place in the industrial field, the importance of which is not always realized until it is missed.

THE HERING FURNACE

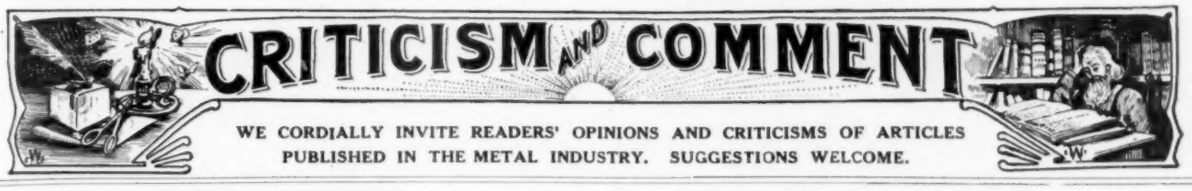
This issue of THE METAL INDUSTRY contains an account of a new electric furnace. This furnace, invented by Dr. Carl Hering, of Philadelphia, Pa., an electrical engineer of note, promises to effect a revolution in the electric furnace art. The bold and fearless way in which Dr. Hering tackled the problem really reads like a romance. How the dreaded "pinch effect," given up in despair by other experimenters, was finally overthrown, and harnessed to do his bidding by Dr. Hering is in itself a wonderful achievement.

The experiments made to date with the furnace proves its efficiency, and so much faith has been placed in the new furnace by the Ajax Metal Company, a large metal corporation of Philadelphia, Pa., that they have bought outright the control of the furnace while still in its infancy! The furnace, as has been said, has been run on brass, bronzes, iron and steel, and has heated them all to a very fluid state in a remarkably short time, considering the crudeness of these small experimental furnaces. The steel was as liquid as water, and was quickly raised to a white heat. The squirting action was even more satisfactory than was expected. The squirting action can be made even quite violent, the forces are so powerful.

It is understood that the chief advantages claimed for the furnace are simplicity and cheapness of construction; much greater economy in consumption of electric power; greater rapidity, as the heat is generated instantly in the material itself, instead of being radiated to it; very thorough mixing, thus producing homogenity; the refinement of the metals of impurities mechanically suspended, or of contained gases, because the material is all repeatedly brought to the surface, where such impurities are expelled, the fact that the temperature can be controlled to a great nicety, and need never be greater than that desired, hence no unnecessary loss of zinc from brass by vaporization. There is no reason why there should be any material loss

of the metal itself, and castings made from such "boiled" metal will be less likely to have blow-holes.

The numerous advantages may be of greater importance and have greater money value than the more expensive electric heat. It is therefore believed it would pay in the end to use electric heat even when it must be bought from city service. As the furnace is a departure in an entirely new field, it will take a little more time to develop it, but Dr. Hering assures us that the furnace is a reality and not an experiment. We certainly will look forward to further reports of the Hering furnace.



NICKEL PLATING

To the Editor of the Metal Industry:

Were all the readers of your paper chemists or had they a general knowledge of chemistry there would be no necessity for me to reply to the last letter from "Electro" which appeared in the April number of The Metal Industry. Inasmuch as this is not the case I feel that I am warranted in continuing the discussion and I will try to make it brief. The question of collecting gases at the anode and cathode I will not question as it is a laboratory experiment that can be demonstrated by anyone. I would state, however, that there is a great deal of difference between "gassing" that can be seen with the naked eye and the form of "gassing" that can be detected by a laboratory test. Every nickel plater knows this and commences to correct the trouble when "gassing" begins in order to prevent his deposit from being pitted.

Any well-read man can quote references from well-known books, but it is a difficult matter to correctly interpret the references and not make them misleading. "Electro" has used references without attention to details and they may therefore lead the uninitiated to believe that they apply to the cases at point. This is not the case as can be seen by going into the matter. If "Electro" had continued Lupke's article he would have read the following: "The experiment is best conducted in the apparatus used for the electrolysis of hydrochloric acid" (this apparatus is specially designed for the work, has a very small distance from anode to cathode and uses anodes that are insoluble in the electrolyte). The same authority says further that the electrolyte consisted of 250 c.c. of a concentrated solution of sodium chloride, 20 c.c. of a concentrated solution of ammonium hydrate, and a current from six accumulators was used for one hour. It is obvious that a different condition exists in the case of a solution of nickel ammonium sulphate and that the quotation is misapplied. McMillan also goes further into the matter than shown by "Electro." He states, "Thus the sulphuric acid is neutralized by the nickel (of the anode) and the bath is enriched to that extent by the fresh nickel introduced, while the ammonium is broken up into ammonia (NH_3) and hydrogen (H), the former dissolving in the solution and tending to alkalize it, the latter escaping as a gas from the surface of the object being plated."

"Electro's" own authority states that the action of the current on the nickel ammonium sulphate solution tends to make it alkaline. Personally I am of the opinion that many of the old-time authors used theories that have long since been exploded and it should be born in mind that most of the data obtained at that time was the result of laboratory experiments under conditions that are seldom met in actual commercial plating. We know positively that complete regeneration of a nickel solution from the anode is at this time commercially impossible, if it were not there would be small demand for nickel salts. The quotation from Ewell illustrates this point as Ewell was speaking in a general way and although his remarks might apply in some cases they need not necessarily apply in all. Nickel is one of the exceptions and unless great changes have been made of late, a tin solution demonstrates that anodes do not supply even an approximation of the theoretical amount of metal to the solution in commercial practice. I could go into the theory of plating and quote many authorities, many of whom take opposite views of the same theory, but respect for the readers of your paper, lack of time, and the knowledge that it would require many pages of your paper that can be used to better advantage forbids.

I most emphatically oppose "Electro's" statement about nickel sulphate causing the deposit to become dark and non-adherent. Any such remark coming from a man of his position shows utter lack of knowledge of modern nickel plating as carried on in some of the most up-to-date establishments in the country. Solutions of nickel sulphate with the proper conducting salts added have been used for over three years and have never been touched except to replenish and filter. The deposit is much more rapid than in the case of the nickel ammonium sulphate solution, the appearance is brighter, the adherance as good and the cost of production less. "Electro" loses sight of the fact that although the single sulphate costs more than the double it contains about 21 per cent. of nickel while the double sulphate contains about 15 per cent. Every plater knows that he must pay more for a salt that runs high in metal than for one that runs low, if this were not so few platers would use "copper compound" in place of copper carbonate for copper cyanide solution.

In closing I would suggest that the readers of The Metal Industry give careful thought to all authorities that are quoted from time to time and not take too much for granted. I would also state that no doubt most of the platers who read these articles know who "Electro" is and like myself would like to hear from him under his own name. I of course know the name of the author through reading similar views expressed by him in other publications and it is possible that it would be fairer to him in these discussions should he lend weight to his arguments by signing his own name.

Percy S. Brown.

Oak Park, Illinois,
April 25, 1911.

GERMAN BRIQUETS

To the Editor of The Metal Industry:

As a subscriber to your interesting magazine, and feeling sure that you always like to hear the truth from your readers, I am taking the liberty of pointing out to you an error, which you have made, involuntarily, of that I am quite sure, in Vol. 9, No. 1, page 30, in the article, "German Briquettes From Shop Waste." In this article, there has been attributed to Mr. Ronay, the origin of a "process of agglomeration, which will be patented in all civilized countries," and "the secret of the process being to apply a very high pressure, etc." I think it is only just to give every man his due, and the origin of the use of a very high pressure for obtaining agglomeration of matters reduced to small pieces, belongs to a Belgian professor, Walter Spring, of the Liége University.

More than fourteen years before the requests for patents made by Mr. Ronay, Mr. Spring had published a series of remarkable experiences in which he used nearly 10,000 atmospheres of pressure on all kinds of metallic matters, minerals and salines, reduced to small pieces in view of their agglomeration, by the sole action of pressure. These experiences have been published in different papers, among others, in the bulletin of the Royal Belgian Academy in 1878, second series Vol. XLV, p. 746, and of 1880, Vol. XLIX, p. 323; and in 1895, July 25. These have been reproduced in the *American Journal of Science*, Vol. XXXVI, p.

286, in 1888. In Germany in 1881, in the *Berichte der Deutsche Chem. Gesellschaft*, T. XV, p. 595.

In France in 1882, in the *Annales de Chimie et de Physique*, third series, Vol. V, p. 229; again in 1883 in the bulletin of the Chemical Soc. of Paris, Vol. XL, p. 520; in 1900 in the report on the properties of solids under pressure presented by Professor W. Spring at the Congres International de Physique at Paris. The discovery of Mr. Spring was immediately put into practice by a Dutch manufacturer. After having asked the professor for explanations, who showed him in his laboratory how he ought to operate successfully, the manufacturer set up industrially the agglomeration of waste amber, making different objects, only by applying the invention of Professor Spring, that is to say, by the action of high pressure without any addition.

Do you not think then, Mr. Editor, that it is just and honest to accord the paternity of the invention, which consists of using high pressure only, to agglomerate the mass, to its true father, Professor Walter Spring of the Liége University? The publication of the latters's works date from 1878, so that the first German patent of Mr. Ronay dated October 20, 1892, is fourteen years later.

PAUL CLAES.

Uccle, Bruxeles, February 28, 1911.

[We are glad, of course, to accede to the request of our correspondent, and credit, on the strength of his strong array of incontrovertible evidence, the origin of the briquetting process to Professor Walter Spring. That the article in the January issue of THE METAL INDUSTRY was an injustice to the professor we do not admit. Our correspondent is not entirely correct when he states that the article attributes to Mr. Ronay the origin of a "process of agglomeration which will be patented in all civilized countries." What the article, which by the way was taken from a United States Consular report, does say, is that "the process of a certain company *is* that of the Ronay system, which *has been* patented, etc." The fact that certain Ronay interests had succeeded in obtaining patents on a briquetting system, and a description of the process was all that the article intended to imply and we are sure no injustice was contemplated.—Ed.]

UNSOLVED PROBLEMS

To the Editor of THE METAL INDUSTRY:

I have the following suggestion to offer to the trade: Why not put a heavy base deposit of acid copper after a flash in cyanide solution on steel goods. This buffed, cleaned, and brass deposited on the same would be as useful for practical purposes, and fill the bill as well as a heavy brass coating thus overcoming to some extent the immediate need for acid brass solution sought for in "Unsolved Problems?"* I have used this in some instances for carriage and the hardware trade. Thus far no complaint has ever been received, even regarding such parts as are frequently grasped by the hands, or when considerable ordinary wear takes place. The view I have of this is that ample protection from atmospheric influence is obtained at much less cost than by entire brass plating, unless it becomes possible to secure an acid brass solution. A reverse lever handle on a charter motor boat in continuous use for three whole summers, does not yet show signs of copper deposit through wear of the brass coating, thus showing the efficiency of the method suggested. I mention this, having in mind its application to such parts as steel levers on motor cars, although no doubt it is already being done by some manufacturers.

FRANK EAMES.

Gananoque, Ontaria, April 22, 1911.

*Unsolved Problems, THE METAL INDUSTRY, April 18.



Shop Problems



IN THIS DEPARTMENT WE ANSWER QUESTIONS RELATING TO SHOP PRACTICE OF THE METAL INDUSTRY. ADDRESS THE METAL INDUSTRY.

ALLOYING

Q.—We are having considerable trouble with an alloy composed of approximately 70 per cent. lead, 25 per cent. tin and 5 per cent. antimony, all of these metals having been tested chemically and found to be pure. The difficulty lies in the fact that a white filament forms on certain parts of the metal after it has been cast, just as the metal sets. Up to that time the material is bright. This filament forms on the under side or the side next to the mold as well as on the top of the metal where it is exposed to the air. Can you tell us how to overcome this difficulty?

A.—The appearance you describe is probably caused by pouring the metal too hot. The white filament is due to crystalization and your problem is a similar one to obtaining a bright surface on bar solder.—J. L. J.

CLEANING

Q.—Can you give me a formula to clean silver-plated goods that can be used as a dip and which will not be poisonous?

A.—A simple method of cleansing silver-plated goods was recently patented. It is as follows: Obtain a piece of sheet zinc and bend it to form corrugations similar to a regular waste board. On the top of each corrugation apply some soft solder. This can be accomplished by soldering some straps of wire solder that can be obtained at most plumbers' stores. The idea is to prevent the articles from coming in direct contact with the zinc. Place the zinc in an enameled iron receptacle and add a solution consisting of eight ounces of bicarbonate of sodium in each gallon of warm water. Place the articles to be cleansed upon top of the soldered corrugations and electrolytic action is at once set up which will remove oxides and discolorations. This method may be used continually if the zinc is removed from the solution when not in use. Lacquered or greasy articles will not be affected by the process. If the action of the solution is slow, add more of the bicarbonate of sodium. (This is a cheap method.)—C. H. P.

COLORING

Q.—Can you tell us how to make up a black plating solution for cycle work. We keep a lot of silver work, that has been plated, about and should like to know if the solution will give off fumes likely to tarnish or discolor the silver.

A.—To produce a black plating solution for your purpose use the following formula:

Double nickel salts	8 ozs.
Ammonium sulpho cyanate	2 ozs.
Sulphate of zinc	1 oz.
Water	1 gal.

Use old nickel anodes as anodes. A voltage of one-half to one volt, an excess, produces a gray tone instead of black. Polish your articles and flash them in a copper, brass or nickel solution. Then plate for twenty minutes to one hour. For a dead black surface, sand blast previously, then proceed as stated. The longer the immersion the blacker the deposit. To maintain the solution add a small amount of zinc; and the ammonium salt when the solution produces a nickel tone; when too slow add nickel salts.—C. H. P.

CORE-MAKING

Q.—Will you kindly furnish me with mixture of core sand for brass valves, one that can be blown out of casting in water, leaving the casting clean and of good color inside?

A.—A mixture of core sand for valves that will give excellent results consists of the following:

Old molding sand (taken from the floor)....	1 part.
Beach sand	2 parts.

Where beach sand cannot be had, silica rock sand, same as used in glass houses, will answer. Temper with a mixture of molasses water, mixed as follows:

Molasses	1 gal.
Water	10 gals.
Any good core oil	½ pt.

If the core is not strong enough add more molasses. You will find that this mixture will leave your castings as smooth inside as on the outside.—W. J. R.

FINISHING

Q.—Kindly advise us if there is any process by which we can secure a satisfactory brush brass finish on plain brass tubing without first buffing the tubing?

A.—A method which gives very good results for brush brass finish without buffing is as follows: If the tubing has been annealed remove the fire scale with the usual sulphuric acid pickle, then immerse in strong aqua fortis (yellow 38 per cent. Baume) for a few seconds. This is termed the scaling dip. Then remove, wash, immerse in the potash, drain well and plunge in the bright dip momentarily. Then remove, wash in cold water, pass through a dilute cyanide dip to remove stains and scour down. This can readily be accomplished by using a crimped brass wire scratch brush revolving at about 800 to 1,000 revolutions per minute. Apply just a little pumice stone, ground fine and mixed with water, when brushing. Rewash, pass through the dilute cyanide dip, wash, dry and lacquer. This method will give you excellent results and save you the trouble of buffing. The bright dip should consist of

Aqua fortis 38%.....	1 gal.
Oil of vitriol 66%.....	1 gal.
Muriatic acid	2 ozs.
Water	1 qt.

—C. H. P.

HARDENING

Q.—I notice that in the January, 1911, issue of THE METAL INDUSTRY, page 38, is given a hardener for aluminum. I should be pleased if you would show by calculation the percentage composition of the castings produced by the use of the hardener.

A.—If a hardener is made up in the proportion of 40 lbs. of copper to 60 lbs. of aluminum, each five pounds of the hardener will contain two pounds of copper and three pounds of aluminum; hence to secure 7 per cent. of copper in an alloy, 3½ times 5 lbs. of the hardener of 17½ lbs. will be required.—J. L. J.

MELTING

Q.—Can you tell us of some substance which we could use as a crucible for melting platinum?

A.—The melters of platinum claim that a magnesian limestone (free from silica, iron and alumina) makes a better crucible than a straight calcium limestone of equal purity.—J. L. J.

MIXING

Q.—Will you kindly give us the compositions of linotype and monotype metals?

A.—A good linotype metal has the following composition:

Lead	82.5
Antimony	12.5
Tin	5.0

A formula much used for monotype metal is:

Lead	74.5
Antimony	17
Tin	8.5

Each time the scrap is melted up, add one pound of the following hardener or tempering metal (lead, 63; antimony, 37) to each 100 pounds of the linotype or monotype metal.—J. L. J.

MOLDING

Q.—Will you kindly give me the following information: (1) What is the most suitable charcoal for use in molding fine or faced castings? (2) What is the best kind of sand to use for fine or faced castings? The ordinary molding sand apparently is not suitable. (3) What is the best method for drying molds for fine or faced castings? I have noticed in Birmingham, England, that the molds are placed in the open air round an ordinary iron brazier with a coke fire inside.

A.—(1) Charcoal facings are not used for facing molds for brass castings. (2) The best kind of sand to use for fine or faced castings is French molding sand. In this country a sand called Winser Lock Sand, handled by all foundry supply houses, is used. Any good fine sand will answer if prepared as follows: First bake the sand in a new crucible; then roll it, screen it through a series of sieves of a required fineness until it resembles flour; temper with molasses water or salt water. To produce the best surface on a brass casting the pattern should be printed back, *i. e.*, the pattern is drawn and the mold dusted with lycopodium powder and the pattern replaced and the mold rammed; thus the pores are closed and the liquid metal prevented from sinking into the surface. (3) After drying the mold is sometimes smoked with rosin, which gives a very nice surface on the castings. The Birmingham practice is good and is practically the same as in this country, only in large foundries a special gas stove is built that gives about the same results.—W. J. R.

OXIDIZING

Q.—Can you give me a formula for oxidizing brass chandeliers?

A.—Unless you desire to arrange a regular plating solution to produce the black surface for the oxidized chandeliers the regular ammonia copper solution will give you the best results. The surface of the articles should be relieved in the same manner as oxidized copper. The ammonia copper dip consists of the following:

Ammonia, 20%	1 gal.
Dry carbonate of copper.....	½ lb.
Carbonate of soda.....	8 ozs.
Warm water	2 qts.

Polish and cleanse the articles before immersing in the black dip. After the articles become black, wash them in clean water; then immerse in a potash bath for a few seconds to set the black; then wash, dry, relieve and afterwards lacquer in the usual manner.—C. H. P.

PLATING

Q.—We have a composition metal which we wish to strike before copper plating and nickeling. Can you give us a steel strike for this purpose?

A.—To produce a steel strike for your purpose, dissolve one and a half pounds of sulphate of iron and one-half pound of ammonium chloride in each gallon of water. Use anodes of soft steel. The current should be from three to four volts. Cleanse the articles, then plate them in the steel solution for a few minutes, or until coated with a light coating. The articles can then be directly coppered or nickeled after washing in cold water.—C. H. P.

Q.—Can you please give me the following information: A dip that will remove scale from pewter metal preparatory to silver plating; how to lay silver so as to obtain a heavy deposit; the best method to nickel plate knives so that they will wear well?

A.—(1) Use a 10 per cent. solution of muriatic acid and water to remove the lead oxide, then scratch brush it wet, using a steel scratch brush for the purpose. This will soften up the surface. Your trouble may not be due to the surface itself but when polishing you probably use too high a speed

which glazes or burns the surface. Such articles give better satisfaction when they are sand buffed. This keeps the metal cool and prevents glazing.

For heavy deposit work your solution is probably too low in metal for such work. A solution should contain not less than 4 ounces of silver to the gallon. It takes six to eight hours to deposit a surface such as usually put on steel knives. The solution must not contain too much free cyanide.

Nickel deposit like silver depends upon the thickness of the plate. Two or three hours should give a good wearing plate. A solution for the purpose should consist of

Double nickel salts	8 ozs.
Single nickel salts	2 ozs.
Sal ammoniac	3 ozs.
Water	1 gal.

The knives should be polished in the regular manner to get a smooth surface, cleansed and plated for the time stated with a medium current. Afterwards the nickel surface should be lightly cut with tripoli and then finished with a good Vienna lime composition.—C. H. P.

Q.—Our silver plate work does not plate evenly, some batches containing more silver than others, and we would like to know if there is a device made for weighing the silver as it is deposited, and who could furnish us with same?

A.—Under normal conditions each batch of work should receive the same amount of silver, providing the cathode surface is the same and the voltage and amperage is the same. If you are using a dynamo of four volts and doing other work, such as copper or brass plating, this would cause a fluctuation of the current on account of the higher resistance of these baths. When such articles were being plated the voltage and amperage would be considerably reduced on the silver tank; when the articles were removed from these plating tanks the voltage and amperage would be increased. This would increase or diminish the silver deposit according to the amount of current flowing. If you use a volt and ammeter in your circuit you should be able to control the deposit; if not, it would be advisable to use them. The manufacturers of the Sangamo Ampere Hour Meter claim that the weight of the deposit can be controlled to deposit as much or as little metal as required.

The common methods used in silver plating by weight are to have an agitated solution, then if the articles approximate the same amount of cubic surface, one piece is carefully cleansed and weighed; this is noted and placed in the bath with the other articles. This weighed piece is removed occasionally and weighed by troy-weight. If one pennyweight is required on each article, then when one pennyweight has been deposited upon one article all the others should have the same amount, provided, as stated, that the conditions are normal when each batch of work is placed in the tank. This is the method used by manufacturers of silver-plated spoons, knives and other articles.

If the surface of the articles vary, as, for instance, in a chandelier, then it is advisable to weigh all the various pieces together, having a combination scale, graduated in two sections, the upper part of the balance with troy-weight, the lower part with avoirdupois. The exact balance of the articles is obtained by the lower balance (if a sliding weight is used, which can be made with a screw, so the balance can be secured). When the articles are plated the sliding weight on the upper beam will give the exact amount of silver deposited in troy-weight upon the articles. By a little experimenting the amount of silver deposited in a certain length of time can be determined, so it will be possible to come very near to your estimates on the amount of silver deposited.—C. H. P.

PATENTS

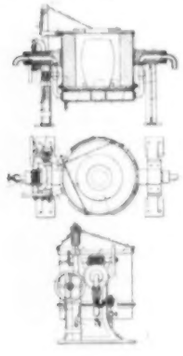
REVIEW OF CURRENT PATENTS OF INTEREST TO THE READERS OF THE METAL INDUSTRY.

982,884. January 31, 1911. Soldering Iron For Soft Solders. Heinrich Schweitzer, New York.

This soldering iron has the advantage over others that the wooden handle can be brought in a position near to the copper point while it may be easily effected to locate the handle more distantly from the copper.

The patent covers the combination in a soldering iron of a handle having a longitudinal groove along one side thereof, a rod hinged at one end to said handle adjacent to an end of said groove, a copper bulk on the other end of the rod, and means mounted in the handle for locking the rod in the groove when the rod is swung about its hinge into the groove.

987,793. March 28, 1911. Crucible Furnace or the Like, Wm. Buess, Hanover, Germany.

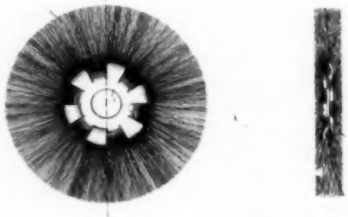


This patent covers a crucible tilting furnace, where liquid or gaseous fuel is employed. A novel method is employed for raising the cover, as shown in cut, and swinging it to one side. The furnace device is included in the following claim.

A device of the character described, comprising a crucible furnace, a cover therefor, a rod to which the cover is hinged, means for vertically lifting the rod, automatic means for simultaneously swinging the cover in a horizontal plane, a manually operable eccentric pivoted to the rod, and a chain secured to the cover and engaging said eccentric.

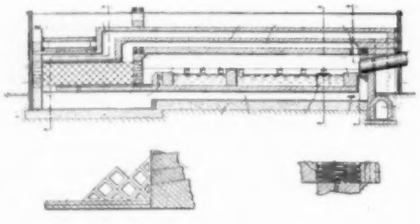
988,506. April 4, 1911. Rotary Brush. Rudolf Radiuse, Cleveland, Ohio. Assignor to the manufacturers, Brush Company, Cleveland, Ohio.

The particular object of the invention is to provide improved means, as shown in cut, for holding the wires or bristles of a brush in place, this result being effected by the use of a single plate with peripheral tongues struck up at the edge thereof, these tongues serving to clamp or hold a wire around which the bristles or their equivalents are bent. The invention has the advantage that only a single central plate is necessary to hold the other parts of the brush in place, and accordingly the parts may be very cheaply constructed and assembled.



988,131. March 28, 1911. Furnace for Melting Metals, Glass, etc. Lambton, Le Breton, Mount, Bayswater, London, England.

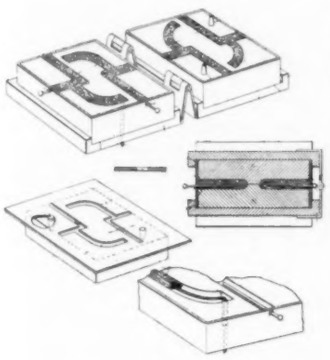
This invention relates to furnaces for melting metals, glass or the like and for roasting or calcining ores, salt cake, or the like and other purposes. The main objects of this invention are to obtain economy of fuel by an improved arrangement and construction of the parts of such furnaces, as shown in cut, to obtain a higher temperature with the same expenditure of fuel than is possible with



the heretofore usual construction of furnaces, to provide an improved construction of recuperator comprised in such furnaces, and to provide improved means for taking up thrust due to expansion upon adjacent abutting work such as the crown of the furnace and end walls thereof.

988,579. April 4, 1911. CORE-MAKING DEVICE. S. H. Limney, San Francisco, Cal.

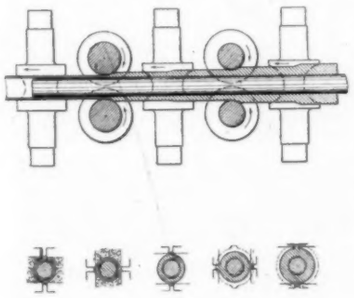
This invention relates to core-making devices and particularly to sectional, foldable core-print boxes. With the apparatus at present in common use in foundries and molders' rooms, it is possible to make only one core-print at a time. This is because, in attempting to form more than one core in the core box, it has been found difficult to trowel out more than one.



It is the object of this invention to construct a print or core box, as shown in cut, which will facilitate the making of a plurality of cores at one time; to provide in combination with the core box means for facilitating the locating of the vent wires and reinforcing wires; and to provide in combination with the core box a heaping plate and a hinged foldable casing and a tray or drier plate, all adapted to form operative and important elements of the core-making apparatus.

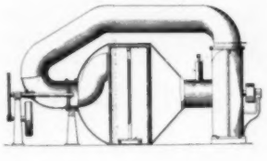
988,634. April 4, 1911. METHOD OF ROLLING TUBES. Aloys Fassl, Dinslaken, Germany.

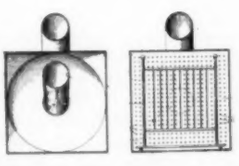
This patent covers a method for rolling tubes of metal in a continuous mill by means as shown in the cut. The method consists in subjecting a longitudinally apertured blank, when assembled on a mandrel, to a rolling action in the mill, and decreasing the contacting area of the successive passes in the mill and the cross sectional area of the blank, so that the speed of the mandrel is determined and controlled by the friction imparted through the work by the rolls at the entering end of the mill.



988,978. April 11, 1911. APPARATUS FOR COATING OBJECTS WITH SUBDIVIDED METAL. G. L. Craggs, Chicago, Ill. Assignor to Bradely and Vrooman Company, Chicago, Ill.

This is an apparatus, as shown in the cut, for coating objects with comminuted, subdivided or powdered material and is of particular service in spreading bronze powder upon objects whose surfaces to be coated are covered or painted with suitable adhesive material or paint which in its fresh state holds the powder scattered thereupon and in its dry state firmly fixes the powder in place.



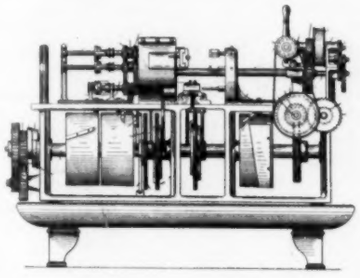


In practicing the invention, a receptacle is employed for containing the object that is to be coated with the powdered material, a fan or blower for effecting forced circulation of air through the receptacle, and piping which desirably includes the blower and receptacle in serial relation to establish a closed local path or circuit, which is preferred, for the circulating air, though the inventor does not limit himself to this particular way of performing the operation.

988,670. April 4, 1911. METAL WORKING MACHINE. C. M. Spencer, Windsor, Conn. Assignor to The Universal Machine Screw Company, Hartford, Conn.

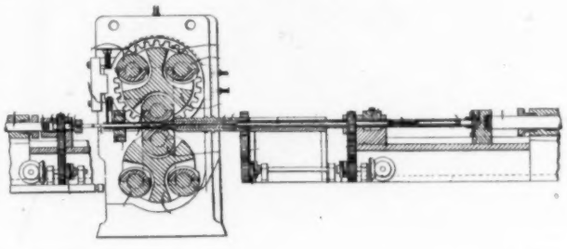
This invention relates to the operating mechanism of an automatic multiple spindle screw machine of the type which is constructed to intermittently feed continuous lengths of rods through rotary and revoluble spindles.

The object of this invention is to provide a mechanism for rotating the spindle carrying head, for opening and closing the rod gripping chucks in the spindles, and for feeding the rods through the spindles when the chucks are opened, which mechanism will act to perform its necessary functions for accomplishing the indexing, chucking and feeding of the rods intermittently and very quickly, independently of the movements of the cutting tools, whereby time is gained for the movement of the tools, and the efficiency of the machine is increased. This object is attained by arranging a continuously and uniformly moving driving mechanism, shown in cut, in such manner that it imparts intermittent but uniform rotary movements to the cams which actuate the indexing, chucking and feeding mechanisms. By the use of such an intermittent drive for actuating these mechanisms, the speed at which they are driven can be greatly increased without employing a variable or change speed mechanism for driving the whole machine. And as a result of this increased speed of action of the mechanisms enumerated, more time can be allowed for the movements of the tools. This makes it possible to increase the length of, and consequently decrease the pitch of, the tool-carrying-slide cams, which enables the machine to be run faster without increasing the rankness of the cutting action of the tools.



989,643. April 18, 1911. MANUFACTURE OF METAL TUBES. Henry Reinhard, Aston, Birmingham, England. Assignor to Tubes Limited, Aston, Birmingham, England.

The object of this invention is to obtain an improved piercing mill, as shown in cut, for making metal tubes.



The invention consists in a process and apparatus, shown in cut, for piercing, having hydraulic, screw and hydraulic, screw, or other suitable means for feeding, and if desired, rotating the metal over a mandrel; rolls such as pilger rods for acting circumferentially on the metal; and auxiliary means acting so as to assist the end of the piercing, to position the bloom on the mandrel or to withdraw the mandrel from the bloom.

990,040. April 18, 1911. IMPROVING THE CONDUCTIVITY AND TENSILE OF COPPER AND ITS ALLOYS. Rudolf Franke, Eisleben, Germany. Assignor to Elektrochemische Werke (G., M. B. H.), Berlin, Germany.

The object of this invention is to improve copper and its alloys for electrical conductors in such manner as to increase both the tensile strength and the electrical conductivity thereof.

The inventor has discovered that the tensile strength and conductivity of copper and alloys where copper predominates, can be increased by the addition of less than 1 per cent. (.35) of calcium and less than 1 per cent. (.35) of molybdenunn.

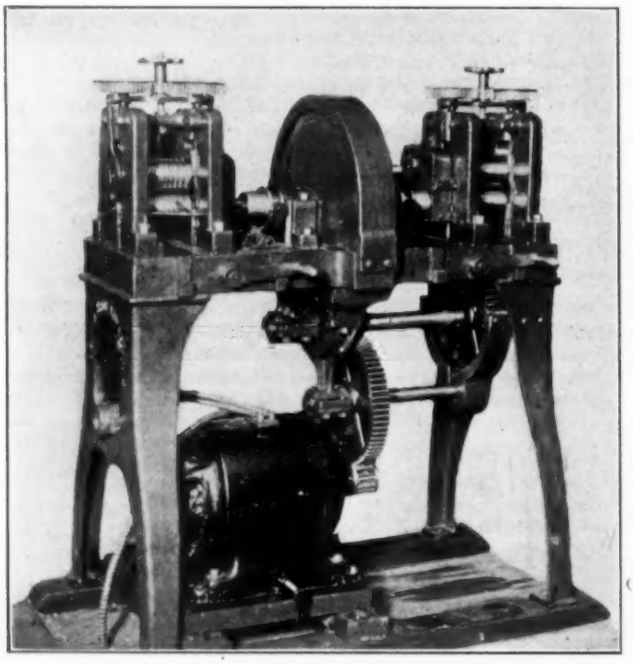
INDUSTRIAL

NEW AND USEFUL DEVICES, MACHINERY AND SUPPLIES OF INTEREST TO THE READERS OF THE METAL INDUSTRY.

TWO ROLLING MILLS IN ONE

There has just appeared on the market a rolling mill which is a distinct departure from any device heretofore offered to the metal industry. This machine is designed for the use of manufacturers rolling gold, silver, brass, copper and other like metals and possesses many features not heretofore found in devices of this kind. The compactness, ease of handling and economy of power are three strong points that are urged by the manufacturers in connection with the machine.

By referring to the illustration it will be seen that this rolling mill is of the familiar table type wherein the rolls are mounted on an iron table with the difference that instead of having one set of rolls on the table there are in this case two sets, one on each end of the table. Both rolling mills may be operated by means of the motor which will be seen mounted underneath the table. By means of a slip collar arrangement both of the mills



LEIMAN BROTHERS COMBINATION SHEET AND WIRE ROLLING MILL.

may be operated at one time by simply turning a handle at the front of the table.

In a great many cases it is desirable when rolling square wire to run from a certain size down to a very thin wire, in which case this machine has many advantages over the old style, as the wire can be started from one roll and run down to the thinnest grade in the other. These rolls are made of a special grade of steel, especially adapted for this class of rolling and these are mounted on phosphor-bronze bearings. These are in turn mounted in a housing of the proper design and construction to withstand the severe strains to which the mill may be subjected.

The motor which is mounted underneath the rolling mill may be of any standard make and of any voltage desired, the horsepower required depending upon the class of work done and the speed of operation. For most work, however, when the mills are used for flat rolling on one side and wire rolling on the other, instead of both being used for flat or both for wire, about 1½ horsepower is required. This motor is connected to the driving shaft by means of a rawhide gear which not only adds to the running qualities of the machine but also makes the outfit practically noiseless. This driving shaft is in turn geared to the slip collar shaft. This large gear is protected by a covering as shown in the illustration. On each end of the slip collar shaft are the collars which are operated by the two levers at the front of the table. When it is desired to start the roll on the left hand side the lever on that side is thrown over and the other side is operated in the same manner. These slip collars, when the lever is thrown, engage the rolls proper and the machine is set in operation. The lifting gears on the machine are of the latest type and especially designed for a machine of this kind, lifting the rolls very rapidly, and the adjustment is of the finest degree. This machine is also furnished without the motor so that it can be driven from a line shaft or counter shaft if desired.

In these days of high rents when space is very valuable, any machine that economizes in this respect is very likely to find a large field and this device not only saves space but power as well. The ease of running of the machine is remarkable considering the heavy design and the class of work done. Up to this time when a table rolling mill of this style was desired it was necessary to have one for rolling flat and one for wire in each case and additional space was necessary to accommodate them. The advantages of this machine are therefore very apparent.

These mills are now being manufactured by the well-known manufacturers of jewelers' machinery, tools and work benches, Leiman Brothers, 62 John street, New York. They have already been supplied to many large manufacturers in the metal industries and so great has been the reception of the idea that many orders for the machine are booked ahead. The machine, which is really the equivalent of two of the old type, costs very little more than a single machine and therefore it is not surprising that the reception of the machine has been so gratifying. All information in reference to the machine can be secured by writing to the manufacturers at 62 J. John street, New York.

CHEMICAL FLUXES

The Grasselli Chemical Company, manufacturing chemists of New York, Chicago and Cleveland, are pushing their various chemical products in recent literature as follows:

CHLORIDE OF ZINC.

This article is also known chemically as muriate of zinc. It is used principally in the metal industry as a flux in removing the oxide in aluminum castings. It is the best deoxidizer ever found for this purpose and its use in this connection has been coming into favor in the last few years and at present is being used by nearly all the large concerns who do aluminum castings. It is used in the proportion of about 5 ozs. of granulated chloride of zinc to the 100 lbs. of metal. It is simply thrown on top of the crucible and stirred into the metal with an iron or graphite rod just before pouring. It insures the entire elimination of oxide and in this way insures clear, solid castings without flaws.

The quality of granulated chloride of zinc suitable for the above purpose is packed in 10, 50 and 400-lb. cans. The fused chloride of zinc which is the product with the excess moisture driven off, is in the form of a solid block similar to stone and is packed in only 1,000-lb. sheet iron drums.

SALAMAC.

This article is simply a high-grade Sal Ammoniac compressed into bars 8 x 1½ inch square. It is used principally by tinners who use the soldering iron in their work and is required for cleaning and retinning the iron. It takes the place of the old lump Sal Ammoniac and is much more economical on account of the fact that it does not crumble under pressure as does lump Sal Ammoniac.

It is also used extensively by concerns doing heavy galvanizing such as cast iron pipe, structural steel for removing spots on the work as it comes out of the spelter bath; this is done by simply rubbing the spots with the bar of Salamac and in this way fluxes it and allows the still molten spelter to cover it. This operation, however, must be done immediately on raising the work from the metal so as to work on it while it is still very hot. The old method of treating these spots on light pieces, and the former method of treating this heavy work, was to throw a handful of Sal Ammoniac at them; very little of the Sal Ammoniac was required, consequently most of it was lost.

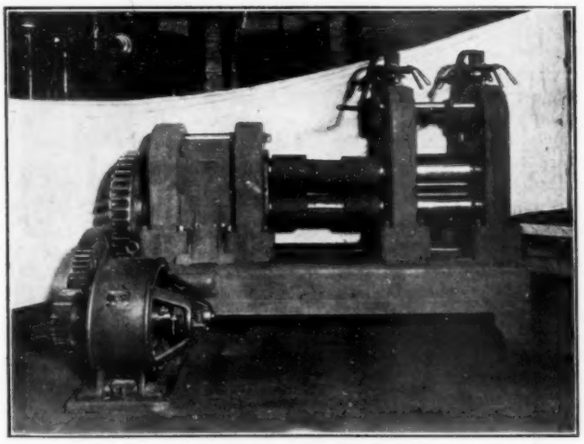
SAL AMMONIAC.

This article is also known by the chemical term of ammonium chloride and muriate of ammonia. It is used in many different degrees of purity and several different forms of granulation. Its uses are varied. The principal consumption being for galvanizing, tinning, making electrical batteries and fluxing white metals. Sal ammoniac has been found to be an exceilent flux for use when melting down aluminum dross, also in the manufacture of aluminum alloys where it is not permissible to use chloride of zinc.

NEW TYPE ROLLING MILL

The Standard Machinery Company, Providence, R. I., have just brought out the direct connected rolling mill shown in the pictures.

This machine has many special features and is fitted both with plain bronze bearings and patended roller bearings. The accompanying photographs show the machine with regular square section roll housings, fitted with rolls 12-in. diameter, 20-in. face; heavy phosphor bronze bearings on the roll journals with crucible steel adjusting screws. The upper boxes are supported by side-yokes which straddle the adjusting screw and which are connected to the boxes by straight rods for lifting purposes. On the top of each upper box is a hardened and ground tool steel thrust washer to take the thrust of the screw. The outboard or roll housing is set on the bed with "T" slots and "T" bolts in the bed allowing the use of different length rolls, the housings sliding in and out. The maximum length roll that can be used is 22 ins., whereas the minimum length is 10 ins. face, 12 ins. diameter. The rolls are driven by cast-steel wabblers and

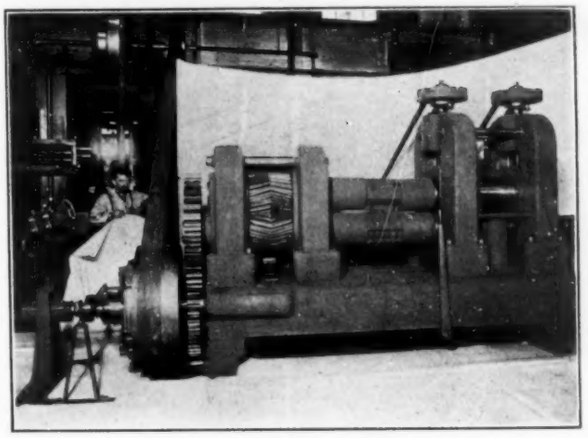


DIRECT CONNECTED ROLLING MILL, SHOWING DRIVING MOTOR.

cast-steel wabbler couplings direct connected to the herringbone pinion shafts which are in the gear housings.

A special feature of the gear housings is the herringbone pinions which are 13 ins. pitch diameter, 14 ins. face; each pinion being 7 ins. face and being made right and left. They are forced over a crucible steel shaft which has a bearing in the gear housing. The pitch of these pinions is 2, and tney are made of forged steel and all teeth are cut making an unusually and accurate uniform drive to transmit to the rolls.

Exclusive of both the motor drive and herringbone the mill is triple trained and when the motor gear and pinion are taken in to account it is four trained; with herringbone pinions it is five trained. The total ratio including all gears is 84 to 1; the ratio of motor pinion to the gear is 2.4 to 1; the ratio from driving shaft of the mill to the roll 35 to 1; the floor space is 15 ft. x 8 ft.; the overall height 8 ft. 6 in. driven by 50 h. p. direct current motor at speed of 1,000 r. p. m. The roll journals are 9 ins. diameter and 9 ins. in length; the length of the bed of the mill is 10 ft. 2 ins. The main driving gear on the gear housings of the mill is shrouded gun iron and the pinion meshing into this is of the same material; the other two trains of gearing contained in the mill proper have cut teeth and are of cast steel; the gear is supported by outboard bearings; the rear end of the mill including outboard bearings and motor sets on bed plate and the motor is con-



DIRECT CONNECTED ROLLING MILL SHOWING FRICTION CLUTCH.

trolled by a variable speed device allowing the use of different speeds while rolling.

The adjustment is controlled by spanner arrangement shown in photograph and for heavy strains by off set wrenches which are brought down to the height of a man's shoulder. The adjusting screws are fitted with micrometer adjustment. The total weight of this machine including bed plate with motor is 27,500 lbs. and is made in various styles, both with single and double housings. The machine is fitted with either friction clutch drive, chain drive or direct gear drive as illustrated above. When fitted with roller bearings on the roll journals the necks of the rolls are chilled as well as the body, for some times the necks of the rolls are made of steel welded into the body of the roll. Fitting it with roller bearings, the gear ratio of the mill is also reduced to 24 to 1, exclusive of the motor gear drive. Further information will be furnished upon request by The Standard Machinery Company, Providence, R. I.

2-PLY BRITANNIA METAL

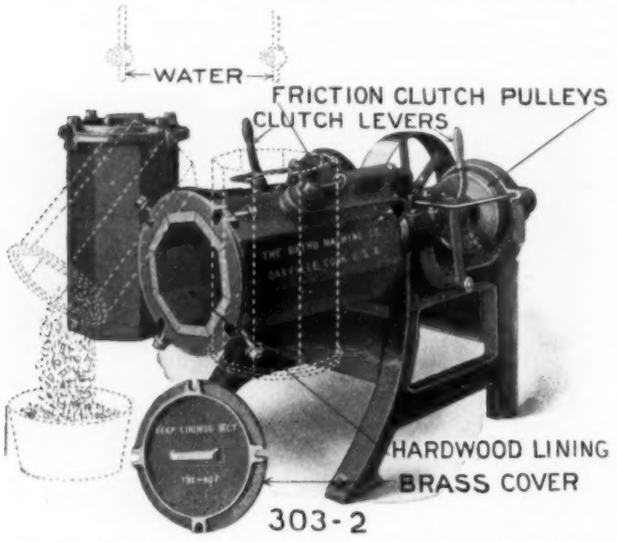
The Hoyt Metal Company, manufacturers of white metals, etc., New York, are putting a new product on the market which they call 2-ply Britannia Metal. It is already being used with great success as a substitute for Britannia metal where only one side of the sheet need be of Britannia, as, for instance, on brush and mirrow backs, name plates, etc., etc. The product has regular Britannia on one side and a cheaper alloy, composed of tin, lead, copper and antimony, on the other side. By this process these two alloys are perfectly welded together but do not become mixed to the slightest degree. In stamping this 2-ply Britannia on difficult dies, it is handled exactly like Britannia; that is, heated and oiled.

The process is not confined to this one combination of alloys. The company is also making a 2-ply music plate, which is being used for engraving and which has been on the market for some time. It is now being used by the largest music engravers in the country.

They are also making a 2-ply tin. This has pure tin on one side and antimonial lead on the other. It is to be used in place of pure tin for lining tanks and vessels. As will readily be seen the tin for this purpose need be on only one side of the sheet.

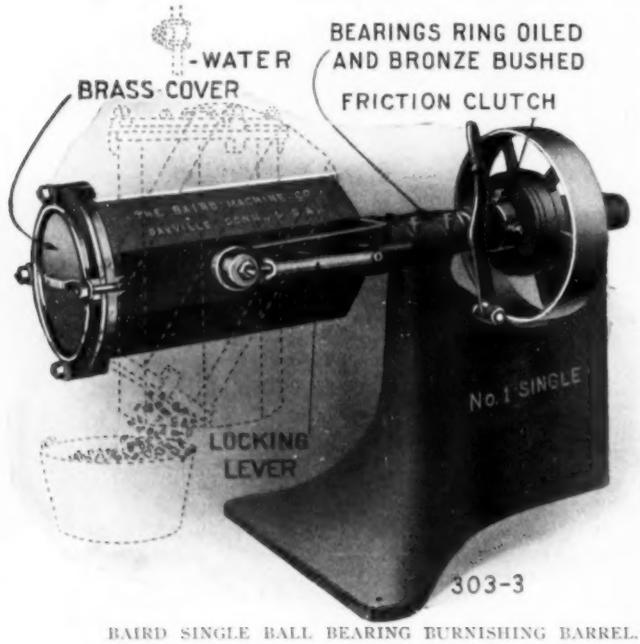
THE "BAIRD" IMPROVED BALL BURNISHING BARRELS.

It is claimed by the Baird Machine Company, Oakville, Conn., that the remarkable success of the double horizontal tilting tumbling barrel built by them, for use with steel balls in the burnishing and buffing process, has resulted in the development and perfection of many original ideas, all of which are incorporated in the new design of machine for this work as illustrated herewith.



BAIRD DOUBLE HORIZONTAL TILTING TUMBLING BARREL.

When in operation, the barrels are in a horizontal position, but, for emptying or filling, they may be easily tilted, as they are supported on trunnions near their centers by heavy yokes secured to the driving shafts. The locking device which holds them in a horizontal position is simple and convenient; the method of holding the cover to which a gasket is secured, effectually prevents leakage, requires very little time to operate and affords no loose parts to get lost. A pulley of ample size drives both barrels through suitable bevel gears and friction clutches and the arrangement is such that either barrel may be operated entirely independent of the other. This allows the operator to run one barrel while emptying or filling the other, which results in considerable saving of time. Owing to the use of friction clutches, the driving pulley should be belted direct to line shaft, the use of a countershaft being unnecessary.



BAIRD SINGLE BALL BEARING BURNISHING BARREL.

All bearings are bronze bushed and of generous proportions, the main shaft bearings being ring-oiled. The barrels are polygonal and are lined with maple, this construction permitting of the easy renewal of all wearing parts, prolonging the life of the machine almost indefinitely, and also of rolling brass or plated articles. The barrels inside are 10½ in. in diameter and 24 in. long, experience having taught us that the small diameter lessens the danger of bending, denting or otherwise injuring small or delicate parts without retarding the speed or quality of finish. Bulletins containing further information may be had from the makers, The Baird Machine Co., Oakville, Conn.

To take care of small concerns, experimental and special work, etc., for large concerns, The Baird Machine Company has just got out a single ball burnishing barrel, shown in cut, having the same important features of friction clutch drive, tiltable barrels, brass cover, wood-lined barrel, etc., as has the double machine. The friction clutch pulley allows the machine to be belted direct to main shaft and either parallel or at right angles to it. It is made in two sizes: No. 1, with 10½ inches diameter by 24 inches barrels inside; No. 2, with 16 inches diameter by 30-inch barrels inside.

SOLDERALL

Recently there has been introduced on the market a new form of solder which is attracting great attention in all electrical and kindred lines as a quick, handy means of joining wires and general repair work in which solder is used. This solder consists of a very finely pulverized tin solder combined with a special non-corrosive flux made into paste form, and put up in convenient collapsible tubes, as shown in cut.



THE SOLDERALL TUBE.

The advantages claimed for "SOLDERALL" by its makers is its convenience in handling, it being complete, ready for instant use. All that is necessary when using it is to squeeze a little from the tube on the parts to be joined and the application of heat will make a perfect job. For joining wires and small work, an ordinary match can be used with success; for larger work, a hot iron or torch is recommended. "SOLDERALL" may be carried around in the pocket the same as an ordinary screw driver. It does away with waste, and as it can be directly applied to the part where the solder is needed, it results in a better finish. All dealers are being rapidly supplied with "SOLDERALL," as it is taking the place of other forms of solder. The "SOLDERALL" Company, of 143 Liberty street, New York, N. Y., are the manufacturers and distributors to the trade.

CARBORUNDUM COMPANY'S EXHIBIT

One of the most complete exhibits to be held in connection with the display of products manufactured by the members of The Foundry and Machine Exhibition Company, to be held simultaneously with the convention of the American Foundrymen at Pittsburg, will be the showing of the products of The Carborundum Company, Niagara Falls, N. Y.

The carborundum exhibit will include carborundum and aloxite wheels, carborundum fire sand, carborundum paper and cloth, aloxite cloth and other carborundum products of interest to the foundrymen. One of the big features of the carborundum exhibit will be the installation of several grinding machines, upon which will be demonstrated the wonderful cutting powers of carborundum and aloxite wheels. So far as is possible, grinding will be done under actual shop conditions, and the foundrymen who visit the carborundum booth will be invited to test the wheels for themselves. The wheels will be shown grinding grey iron, malleable and small castings, and everything possible will be done towards convincing the foundrymen of the economy and efficiency of both the carborundum and aloxite wheels.

IDEAL CRUCIBLE BLOCK

After a series of exhaustive tests the Ideal Furnace Company, Chester, Pa., claim to have produced a crucible block which will be of great benefit to the brass founder and will lead him to consider the crucible manufacturer as a friend. As shown in the cut the crucible rests on four raised surfaces, about two inches wide and four inches long. The rest of the top of the block is grooved and tapered so that



IDEAL FURNACE COMPANY'S NEW CRUCIBLE BLOCK.

in effect the entire bottom of the crucible is exposed to the same degree of heat as are the walls; thus doing away with the unequal expansion which often sets up between the walls and the bottom of the crucible when the solid base or just a simple groove is used.

The Ideal Furnace Company have just completed a test made with one hundred No. 225 crucibles and out of fifty crucibles that were used on the solid block six developed cracks, cutting down the average to 28 heats, while on the block here described not one of the fifty showed any crack and the average life of a crucible was 42 heats.

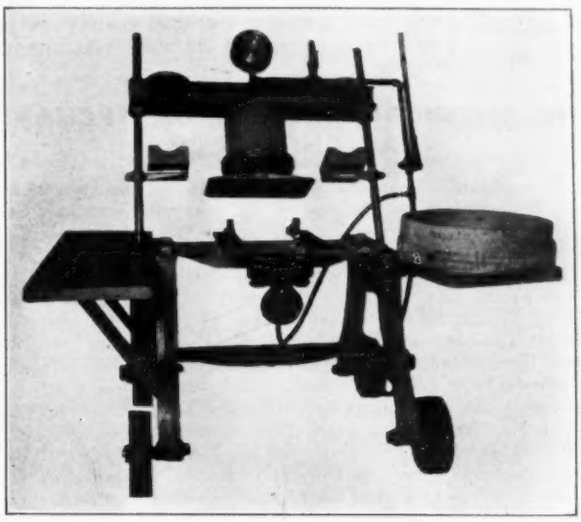
PORTABLE PNEUMATIC MOLDING MACHINE

The J. F. Webb Manufacturing Company, Davenport, Iowa, has developed a new portable pneumatic power ramming molding machine, to be used for snap flask work and such work where one man can handle the flask. Fig. 1 shows the machine with ramming head swung back ready for the flask. For patterns that are mounted on plates the flask is placed on table of machine with the pattern between the cope and drag of flask. The drag is filled with sand, the bottom board placed in position and the flask rolled over, then the cope is filled with sand. The head with the cylinder attached is swung forward and the air turned on, when the piston travels downward and rams the sand, ramming both cope and drag at one operation.

The cylinder can be adjusted with the adjusting nuts on the side rods, so that the sand can be pressed to any density required. The swinging head with the cylinder is adjusted with springs so that it swings with very little effort and is evenly balanced. Flasks 14 x 20 x 8 ins. deep can be rammed with an air pressure of 40 lbs.

The machine as now built has a number of improvements over the No. 2 machine as shown in THE METAL INDUSTRY, December, 1909. A larger side shelf and a swing riddle rack are among the changes. It is claimed that the rack is the only one on the market that saves the operator time in reaching for his riddle. It is a swinging shelf that swings half way round.

The bed of the machine has been made larger, which makes it stronger, and the journal of the swinging head has been lowered so that now it is close to the ground and by having it that way it gives the head a larger swinging distance, and it swings clear of the table. The swinging head is balanced evenly with springs and requires very little effort to swing back and forward, which is quite important. Either style vibrator can



PORTABLE PNEUMATIC MOLDING MACHINE MADE BY THE J. F. WEBB MANUFACTURING COMPANY.

be used; that which can be fastened to the pattern or that which can be fastened direct to the machine.

HIGH GRADE POLISHING COMPOSITIONS

In Bulletin No. 122, Hansen & Van Winkle Company, Newark, N. J., give these interesting facts regarding polishing compositions:

Tripoli compositions are made by combining with powdered and bolted tripoli various greases and waxes which are used as a bond and to permit the adhesion of the composition to the buffing wheel. Many grades of composition are made—some with cutting and others with polishing qualities, or with a combination of both; and it has been necessary to provide compositions at varying prices. While the tripoli powder used in all grades is the same, the difference in price and working value is largely due to the quality and quantity of material used as the bond. Buyers frequently endeavor to purchase a low priced material; consequently manufacturers find it necessary to eliminate the best quality of greases, losing the firm, binding quality which makes the most economical article. The better grades of compositions are solid and firm, will cling to the wheel and do effective work, while the lower and cheaper grades will prove more wasteful as the material will not spread properly on the wheel, and a considerable proportion will be lost.

PURE CHEMICAL PRODUCTS.

The Niagara Alkali Company, Niagara Falls, N. Y., sole American manufacturers of caustic potash, have completed their new plant at Niagara Falls except the bleach chambers, which are still under construction. They state that they are turning out a product equal to any now on the market and are rapidly increasing their business. Their arsenic and sulphur free muriatic acid is in steady demand, and an analysis of same is as follows:

	22 degs. Baume.	18 degs. Baume.
Gravity.		
Acidity as HCl	34.69%	34.69%
Non-volatile matter	0.0974	.0790
Iron	0.0079	.0064
Aluminum	0.0060	.0049
Sulphuric acid (SO_4)	0.0050	.0041
Free chlorine	0.0115	.0093
Lead	none.	none.
Arsenic	none.	none.

They are rapidly completing a carbon tetrachloride plant and will soon be in shape to supply a very superior article in this line.

Associations and Societies

DIRECTORY OF AND REPORTS OF THE PROCEEDINGS OF THE METAL TRADES ORGANIZATIONS.

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

The application of mechanical engineering to the field of Cement Manufacture will be one of the important questions considered by The American Society of Mechanical Engineers at their annual spring meeting to be held in Pittsburg, Pa., May 30-June 2, 1911. Papers will be presented covering different phases of the subject, among them that on Edison Roll Crushers, by W. H. Mason, superintendent of the Edison Portland Cement Company at Stewartsville, N. J., and some Problems of the Cement Industry, by Walter S. Landis, associate professor of metallurgy at Lehigh University, and there will be a full discussion by the many interested in cement manufacture who are expected to be present. A feature of the convention will be an excursion by special train to the plant of the Universal Portland Cement Company at Universal, Pa., on invitation of Mr. E. M. Hagar, preseident of the company. Other important topics will be Turbo-Compressors and Forging Presses.

ASSOCIATED FOUNDRY FOREMEN

President, Robert B. Thompson; Secretary and Treasurer, Hugh McPhee. All correspondence to be addressed to the Secretary, Hugh McPhee, 50 Cottage Place, Tarrytown, N. Y. Annual Convention with the American Foundrymens' Association.

On April 22, at the Grand Hotel, Cincinnati, Ohio, the regular monthly meeting of the Cincinnati section of Associated Foundry Foremen was held and after the regular routine of business was transacted, the annual reports of secretary, treasurer and president were read, after which the organization proceeded to have their annual election, this being also the annual meeting.

The association re-elected all its old officers as follows: Herbert M. Ramp, president; F. A. Elbert, vice-president; Wm. McIntosh, treasurer; F. J. Brunner, secretary; Jas. W. McIntosh, sergeant-at-arms. And in addition elected a second vice-president, according to recent amendment added to their constitution, and Mr. Wm. Liddell was chosen as such.

NATIONAL ELECTROPLATERS' ASSOCIATION

President, Charles H. Proctor, Arlington, N. J.; Treasurer, H. H. Reama, New York, N. Y.; Corresponding and Financial Secretary, Royal F. Clark; Recording Secretary, Edward Faint. All correspondence should be addressed to the Corresponding Secretary, Royal F. Clark, 246 Fulton avenue, Jersey City, N. J. This is an educational society, the objects of which are to promote the dissemination of knowledge concerning the art of electro-deposition of metals in all its branches. Meets at Grand Opera House Building, 309 W. 23d St., on the fourth Friday of each month, 8 p. m.

RECENTLY ELECTED OFFICERS OF THE NATIONAL ELECTROPLATERS' ASSOCIATION FOR THE ENSUING YEAR 1911-1912.



C. H. PROCTOR, President. WM. SCHNEIDER, 1st Vice-president. R. H. SLITER, 2nd Vice-president. H. H. REAMA, Treasurer. R. F. CLARK, Corresponding and Financial Secretary. EDWARD FAINT, Recording Secretary.

The regular monthly meeting of the association was held on April 28 with thirty-six members present. The election of officers resulted as follows: President, Charles H. Proctor; first vice-president, William Schneider; second vice-president, Richard H. Sliter; corresponding and financial secretary, Royal F. Clark; recording secretary, Edward Faint; treasurer, H. H. Reama; librarian, August G. Hoffmann; sergeant-at-arms, Thomas E. Haddow; assistant sergeant-at-arms, T. Noonan; board of trustees, G. B. Hogaboom, Hugh Baxter, A. D. Havens, F. P. Davis and B. Popper.

It was decided that all delinquents be dropped from the books of the association. The following annual reports were accepted as read: The president's, the treasurer's and the corresponding secretary's. The retiring secretary, George B. Hogaboom, was presented with a diamond studded, solid 14K gold watch fob, suitably engraved.

The following amendments to the constitution and by-laws were adopted:

AMENDMENTS TO THE CONSTITUTION.

Article 3, Section 1.—"Officers." The officers of this association shall be a president, a first and second vice-president, etc., etc.

Section 2.—The presidents of the branch associations shall constitute the National Executive Committee until a National Association shall be organized.

Article 5, Section 4.—"Duties of Officers." The National Executive Committee: All matters relating to the National Association shall be referred to this committee, which shall make such recommendations as they deem necessary and present same to each branch association to be acted upon.

Article 12.—That the words "such proposal shall take place only at the annual meeting" be struck out.

AMENDMENT TO BY-LAWS.

Article 6, Section 2.— . . . and when deemed necessary an extra assessment not to exceed five per cent. (5%) of total dues, said assessment to be used only for a good and stated purpose.

A branch of the N. E. P. A. has been started at Rochester, N. Y. The officers are Adolph Wahl, president; F. H. Speary, vice-president; C. V. Herring, treasurer, and E. J. Kelly, 11 Hart street, Rochester, N. Y., secretary.

The first annual banquet of the Philadelphia branch of this association was held Saturday, April 22, at the Windsor Hotel, with twenty-four members present. Several members of the New York association attended and spoke, among whom were Messrs. Buchanan, Davis, Hogaboom and Morrison.

The association was presented with its charter by the president, Fred C. Clement, and appropriate talks were given by Walter C. Gold, James R. Moore and Arthur B. Wells.

The eighth regular meeting of the branch was held at Dooner's Hotel, Friday, April 28, with seventeen members present. The committee on the constitution and by-laws reported and read the constitution and by-laws which will now be sent to the New York association for approval. Provost Edgar F. Smith, of the University of Pennsylvania, was elected an honorary member.

The election of officers resulted as follows: President, Fred C. Clement; vice-president, James R. Moore; recording secretary, Joseph L. Dinan; corresponding secretary, Philip Uhl; treasurer, Arthur B. Wells; board of trustees, Hugo Hermanns, William Buckley, August Heck Martin Smith, John Wilkinson; sergeant-at-arms, Charles W. Bailes, assistant sergeant-at-arms, William Buehler.

AMERICAN SOCIETY FOR TESTING MATERIALS

The fourteenth annual meeting of the American Society for Testing Materials will be held at the Hotel Traymore, Atlantic City, N. J., Tuesday to Saturday, inclusive, June 27 to July 1. It is expected that most of the papers and committee reports will be printed and circulated in advance of the meeting. The present membership of the society is 1,342.



ITEMS OF INTEREST TO THE INDIVIDUAL.

W. L. ABATE

Everyone in the brass business will recognize the portrait shown in cut—W. L. Abate—who has recently resigned his position as superintendent of the Nathan Manufacturing Company, of New York, and accepted a position with the Standard Sanitary Manufacturing Company, of Pittsburg, Pa. Mr. Abate will have full charge of their various brass shops with headquarters in Louisville, Ky.



W. L. ABATE.

Mr. Abate is a man with a long experience in brass manufacturing, having started as an apprentice boy many years ago. He was born in Detroit in 1867 and began his career with James Howes & Brother of that city. At that time brass shops were comparatively few in Detroit, but Mr. Abate worked in several of them and at the age of twenty-one was foreman of the Hart Manufacturing Company. From there he went to the Detroit Shipbuilding Company, then to the Michigan Brass and Iron Company and finally to McRae & Roberts' Brass Works, where he was superintendent for a number of years. From the last-named works he came to New York to take charge of the manufacturing end at the Nathan Company, where he has been for the last six years. While at Nathan's he made a study of melting metals with different furnaces and tried out the various makes.

As Mr. Abate is a brass finisher by trade he has naturally been interested in brass working machinery and has invented a number of devices used in turret lathe practice including an aerochuck and a chucking machine.

Mr. Abate has always been interested in the societies for the betterment of the brass business and for several years has been a vice-president of the American Brass Founders' Association.

W. J. Shaw, formerly of Providence, R. I., has accepted a position with the Merigold Electroplating Company, electroplaters and colorers of jewelry and novelties, Newark, N. J.

W. H. Perkins, formerly superintendent of the Waterbury Manufacturing Company, manufacturers of brass goods, Waterbury, Conn., is now connected with J. B. Wise, manufacturer of plumbers' goods, sewing machine hardware, piano and organ locks and hinges, Watertown, N. Y.

C. P. Karr, recently metallurgist for the Nathan Manufacturing Company, manufacturers of steam goods, New York, has been appointed metallurgist and chemist in charge of all the foundries of the Walworth Manufacturing Company, South Boston, Mass.

C. T. Bragg, chemical engineer for the Ohio Brass Company, Mansfield, Ohio, has resigned to accept a position as chief chemist with Berry Brothers, Ltd., manufacturers of varnishes, Detroit, Mich.

DEATHS

Bernard G. Amend, president of the wholesale drug firm of Eimer & Amend, died on Thursday, from infirmities due to old age, in his home, No. 120 East 19th street.

Mr. Amend was born in Darmstadt, Germany, in 1821. He was a pupil of the great German chemist Baron Justus von Liebig, and in 1846 came to this country. The following year he entered the drug business, and in 1856 he went into partnership with Charles Eimer, adopting the firm name of Eimer & Amend. Mr. Eimer retired from business in 1883, but Mr. Amend continued his drug business, gradually developing his plant until it became a wholesale house known all over the country.

Robert F. Cox, president of the Buffalo Copper and Brass Rolling Mills, Buffalo, N. Y., died suddenly April 14 after returning from an automobile ride with his wife.

He had seemed in his usual health and dropped dead while going from the garage to his home. Mr. Cox was prominent in the industrial welfare and development of Buffalo.

He was born in Terre Haute, Ind., fifty-two years ago, and was a prominent business man in Buffalo. He took charge of the Buffalo Copper and Brass Rolling Mills about two years ago, but he was not one of the original founders.

A widow survives Mr. Cox.



BUSINESS REPORTS OF THE METAL INDUSTRY CORRESPONDENTS IN THE DIFFERENT INDUSTRIAL CENTERS OF THE WORLD.

WATERBURY, CONN.

MAY 3, 1911.

Times have remained dull in the Naugatuck Valley brass industries since the first of the year and there is little indication of an immediate improvement that will be general in scope or sufficient to put all the plants hereabouts running on full time. There are several departments of the larger concerns which are working overtime while others are running under schedule and there are no definite indications of improvement for any.

Brass seems to be the most seriously affected, the demand having fallen off for finished brass products to a considerable degree with the exception of a few lines of novelties. All along the line there is evident a determination to keep the expenses down whether it means the curtailing of labor or not. The number of idle men about the shops of Waterbury, men who are gathering in large crowds each morning about the gates of the factories, is variously estimated between 2,000 and 3,500, but the majority of the corporations hereabouts have so adjusted their schedules that the largest possible number is kept working, although on shorter time.

Back of it all there has been one very encouraging sign. That is the foreign business. Some of the shops, such as the Farrel Foundry and Machine Company, have been kept running entirely on their foreign orders and there seems little disposition among foreign customers to cease ordering. The optimists argue from this that the returning tide of prosperity abroad is sure evidence of the return of business. Here and there is little complaint, generally among the manufacturers themselves, about prospects. The trouble seems to be that the prospects are not materializing as fast as they should.

One of the members of the Scovill Manufacturing Company, John H. Goss, in a talk before the Young Men's Christian Association here a few days ago, pointed out that there is no longer no danger that Waterbury will lose its supremacy among the brass centers. Its disadvantages in location as to the sources of supply, high freight rates and the like were pointed out and the fact that the competing corporations of the middle West were already to be reckoned with, Mr. Goss said, made it necessary for the young men of Waterbury to interest themselves in her industries that her supremacy might be maintained.

Waterbury has been training young men for the new factories in all parts of the country for years, and has let them go freely when better wages and seemingly greater opportunities for advancement were offered to them, so that in all the brass centers of the middle West now there are among the prominent workers in the mills and shops Waterbury natives who are attracting other Waterbury natives to their company by the glowing accounts of their success. The trend westward has been marked for years, but seemingly unheeded by the corporations, and in the place of the American-born employee the cheaper alien laborer has been trained. These aliens have made fine workmen in many instances but they are fast getting to be a powerful minority in the personnel of every shop and in some departments there are few English-speaking employees. This is one of the reasons Waterbury young men have preferred the western fields. And one of the reasons the western fields have grown prosperous so rapidly is the presence of New England trained skilled workmen.

There is little prospect of the local industries proving more attractive to the skilled workman who is free to go West than the conditions in their competitors' factories until a radical change is made in methods here that have been complained of only occasionally and borne in silence by the thousands of workers because no remedy was at hand to suggest possible relief.

As to the immediate future hereabouts there seems little question that business must improve. The prediction of the first of the year that a quiet six months was likely seems to be proving correct and there is much store put in the other half of the prophecy, in which a rushing business for the balance of the year was promised. The present conditions here are said to be no different from those throughout the New England States, where the labor market has been dull for six months.

Collectors report fair conditions. F. B. F.

NEW BRITAIN, CONN.

May 3, 1911.

Practically all of the local metal-ware manufacturing concerns are running full time, and a general condition of prosperity is reported. Advance orders are booked ahead at all of the factories, and the prospects of a busy summer and prosperous fall are very bright. In Berlin, near this city, the same condition exists, the Berlin Construction Company having contracts enough ahead to cover several busy months.

Announcement was made but a few weeks ago of an important change which took place in the personnel of the officers of the Berlin Construction Company. D. E. Bradley, who for many years was president of the company, resigned last fall on account of poor health, and George H. Sage, formerly the vice-president, advanced at that time to the presidential duties. No vice-president has been elected. S. N. Robinson is the secretary of the concern, and Mr. Bradley, while he has retired from active supervision, is still a member of the board of directors.

Landers, Frary & Clark, table cutlery, hardware and household specialities, recently let the contract for a new factory and office building. The building will be 350 x 53 feet, six stories high, of plain brick construction with artificial stone trimmings, and will be fireproof throughout. The top floor will be used entirely for offices, and the other five and basement for the machine shop, sample, stock and supply rooms. Three freight and two passenger elevators will be installed in the building, and modern heating and ventilating systems will be used throughout the new factory. This large addition is made necessary by the rapidly increasing business of the Landers, Frary & Clark Company.

Stock in local concerns is quoted fairly high at the present time. Stanley Rule & Level is worth 285, American Hardware at 128, and very few can be found that are below par.

The National Spring Bed Company is to have a new addition to its large factory built in the immediate future. Plans have been completed and the contract awarded.

Plans are being made for a large new factory for the Peck Stowe & Wilcox Company in Southington. When this is built the company will probably close its East Berlin, Conn., and Cleveland, Ohio, factories. The Peck, Stowe & Wilcox Company is the pioneer manufacturers of tinsmiths' tools of America, and an act was recently passed in the Connecticut legislature allowing them to increase their capital stock to $2,500,000. —A. L. M.

PROVIDENCE, R. I.

MAY 3, 1911.

There are reports heard in nearly every quarter and pertaining to nearly all of the metal industries of a slacking off in the volume of business. Such trades as are associated with the building lines are busy, but are behind last year in the amount of business done. The manufacturing jewelry business is the dullest in several years at this time, but it is expected that there will be a considerable uplift from the first of May. The reason for this improvement is looked for in the putting into operation of the joint resolution that was adopted about a month ago by the National Association of Wholesale Jewelers and the National Association of Manufacturing Jewelers not to show or examine new lines for the spring trade until May 1. This has been generally lived up to and the advocates of the system on both

ides are watching with much interest to see how the proposition will work out.

One of the features of its operation was to be seen by the large number of buyers who began to arrive in this city the last week in April so as to have quarters arranged for at the hotels when the ban was raised and the manufacturers were ready to show goods. As the jobbers throughout the country have been buying simply enough for current business needs for several months it is believed that the buying during May will aggregate a very large total.

One of the most important occurrences in this city for a number of months was the purchase by The Silversmiths Company of the Roger Williams Silver Company of this city. The Silversmiths Company is the holding company which controls the Gorham Manufacturing Company and other large silversmithing companies throughout eastern United States and its absorption of the Roger Williams Company adds one more concern to its domination. The sale included the entire assets of the local concern, with the exception of the comparatively small block of stock held by Theodore Bender, who was vice-president and general manager under the old regime. A new manager, William Linker, formerly with Davis & Galt, of Philadelphia, will be associated in the management with Mr. Bender, having been elected president under the new conditions. The business will be continued at the old plant, 101 Sabin street, this city. The business of the concern has been the manufacture of sterling silver hollow-ware, flat-ware, toilet-ware and novelties and is the outgrowth of the business started by Hiram Howard 32 years ago.

Platinum, the metal which is more costly than gold, has been advancing rapidly in price during the past few weeks. The use of hard platinum in the jewelry trade has increased greatly in the last two years. Formerly, practically the only use for platinum in the jewelry industry was in the mounting of diamonds, but now it is coming extensively into use in the making of fashionable jewelry in which fine mesh work and lace-like effects set with diamonds are the most popular. At the recent convention of the National Association of Wholesale Jewelers it was voted to place platinum in the fore rank for fashionable goods, the contention being that its price would make articles manufactured from it almost prohibitive for any but the wealthiest classes.

The M. S. Novelty Company's shop, corner of Culver street and Willard avenue, was the scene of a bad fire one forenoon about the middle of the month and a panic ensued among the 140 employees. Several girls fainted and had to be carried out by their cooler companions. About 50 of the operatives lost their street clothing in the flames. The fire started in a box of lacquer in the engine room in the cellar and in trying to extinguish it, Thomas Kelley, the colorer, and B. T. Edwards, the engineer, were badly burned about the hands and face. When the firemen arrived the flames were shooting from the top of the two-story wooden building. The damage was about $7,500.

The Roco Supply Company, of Pawtucket, was recently incorporated under the laws of Rhode Island to deal in brass goods and supplies. The capital stock is $5,000, divided into 100 shares of $50 each. The incorporators are Walter G. Bradford, of Warwick; William H. Rowe and Robert S. Emerson, of Pawtucket.

Gustave H. Uhlig, for several years foreman of the factory of Cook, Dunbar & Smith Company at 85 Sprague street, this city, has resigned and has accepted a position as the head of the rolled plate and plated wire department which the Attleboro Chain Company has installed at Attleboro.

Clarence G. Remington, formerly with Horace Remington & Son Company, 91 Friendship street, this city, has purchased the refinery plant at Attleboro owned by the estate of the late Charles Barber and formerly operated by him.

The Providence Findings Company is the style of a new concern that has begun the manufacture of jewelers' findings and settings at 283 Thurber's avenue, this city.

The H. F. Jenks Company, of Pawtucket, has been incorporated with a capital stock of $100,000 under the laws of Rhode Island. The incorporators are Frederick A. Thomas, Isaac Butler and Alfred B. Crowe, all of Pawtucket. The company is empowered to engage in a general foundry and machine business.

The Bercu Sheet Metal Works have removed their place of business from 418 South Main street to 43 Bishop street, Providence. W. M.

ATTLEBORO, MASS.

MAY 3, 1911.

Taking an average of the reports of individual manufacturers, April is found to be little better and no worse than April's usually are in the jewelry industry. The coming of May 1 was welcomed on all hands for, whether the new rule of the jobbers was agreed with or not, it meant the opening of the fall trade season. In April there were few orders, most of the factories worked three or four days a week and stock-taking was in order. But all the while considerable attention was being paid to the sample lines, and the salesmen on May 1 found themselves equipped with plenty of novelties and new goods which, from a manufacturers' viewpoint, can spell only success.

The 54-hour labor bill for women and children is slipping through the Legislature without much fight, and labor leaders are already heralding it as a big step in advance. The jewelers are hoping that the attorney-general will rule or that an amendment to the existing law will fix their product as "goods made by seasons," which would exempt them from the 54-hour law except that they could not have a higher yearly average than 54 hours for their women and children employees. Two years ago when the 56-hour bill was discussed, it was found in the factories that 42 and 41 hours, as an average per year for a woman employee, was high under conditions then, but the necessities of the rush season compel 56 or 58 hours a week, which the dullness of the summer makes up for.

Nathan Hercules of Boston, doing business as N. Hercules, wholesale jeweler, filed a voluntary petition in bankruptcy April 25. C. A. Marsh & Company is a secured creditor for $9,000 and an unsecured creditor for $900. Other local creditors are: Bates & Bacon, $1,592; Attleboro Chain Company, $6,705; Mason, Howard Company, $497; Finberg Manufacturing Company, $504; Attleboro Manufacturing Company, $212; G. L. Brown & Company, $448; R. B. MacDonald & Company, $270; J. J. Sommer & Company, $362; Doran, Bagnall & Company, $233; A. H. Bliss & Company, $138. It is said that an offer of 25 per cent. will be made.

Watson & Newell expect to have their big new addition ready in July. The firm is numbered first of all the New England firms who applied to the Pilgrim Publicity Association for copies of the boom booklet which, it is planned, to have distributed to buyers in all parts of the world, telling why New England goods have merit.

Bates & Bacon and the D. F. Briggs Company have formed a co-partnership, known as the Union Plate & Wire Company, to manufacture plated wire and flat stock in the first floor of the Tappan factory.

Failures in the jewelry trade in March are reported by R. G. Dun as 24, as compared to 24 in 1910.

Cunningham, McCarthy & Lane have removed from 5 Maiden Lane to the top floor of the Robinson building.

Curiously enough, despite the dullness in the past few months, there are statistics to show that the last quarter was the busiest in years for the jewelry trade. From the increased sales of gold bars through the New York assay office, it appears that the total of $6,816,120 during the past quarter corresponds to $6,369,755 last year, $5,304,729 in 1909, and $3,758,192 in 1908. The March sales were the best in four years.

BRIDGEPORT, CONN.

MAY 3, 1911.

The first question a stranger puts to a dealer or manufacturer in Bridgeport today is: "How do you find things?" The reply may be in the accepted Yankee form of the same query put to the first questioner. But the answer will eventually be: "Fairly quiet." At best it is equivocal. The fact is that with the exception of the automobile industries and manufacturers and dealers in auto parts and supplies, business is not brisk, though very few take the situation pessimistically. Nor are there an unusual number

of unemployed seeking work. In short, the industries are marking time and proceeding with caution. Many are watching with interest the outcome of the Canadian reciprocity discussion at Washington. Many more, manufacturers, dealers, business men and labor organizations, have been keenly alive to and active in the usual flood of so-called "labor measures" in the State legislature. Compensatory insurance occupied much time last month, while during April, three exciting hearings have been held on the bills designed to legalize boycotting and picketing. At the second hearing, upwards of 600 were in attendance, about evenly divided between proponents and opponents.

Building activities among the industries in Bridgeport have mounted during the biennial term recently ended to an aggregate of approximately $1,000,000. This was shared by fifty-two companies, though an even dozen of them assumed about two-thirds of this amount, or about $625,000. The Warner Brothers Company (corset manufacturers) leads with a valuation of $140,000. The second on the list is the Bridgeport Brass Company, with new works aggregating over $100,000. The Union Metallic Cartridge Company with $70,000, and the entirely new plant of the Whiting Manufacturing Company (silversmiths) at $65,000, are third and fourth. Others erecting new work to the amount of $20,000 or over were:

Bridgeport Vehicle Company	$38,000
Bryant Electric Company	37,000
Harvey Hubbell, Inc.	37,000
Locomobile Company of America	35,000
Automatic Machine Company	27,000
Weidlich Brothers Company	27,000
Bridgeport Malleable Iron Company	23,000
George C. Batchellor & Co.	20,000

Of new work announced, a $50,000 addition to the West End plant of the Crane Company is the largest so far. The Lake Torpedo Boat Company will be much in the limelight in the near future, having secured the Government's consent to construct one of the new even-keel submarine torpedo boats (a type which they control) in their home yard. They are now increasing their yardage and equipment in preparation for the carrying out of this contract.

There will be an undercurrent of excitement getting under everybody's skin here the coming month, inasmuch as the spring aviation meet which was to have been held at Belmont Park, the scene of last fall's international meet, will be held at Bridgeport about the middle of May. It is this city's first official introduction to this new sport, and will override in immediate importance all but the most pressing business.

The annual banquet of the Manufacturers' Association held last month as usual proved to be the manufacturers' social event of the year for southern Connecticut, about 200 assembling at the Stratfield to participate in this now famous "annual." "Charley" Littlefield, the veteran ex-Congressman from Maine, had the banquetters literally "by the sides" before he was fairly well on his feet. Hon. Henry Clews, the New York banker, John A. Stewart, president of the International Peace Conference, and E. G. Buckland, vice-president of the New York, New Haven and Hartford Railroad Company, were the other speakers. A pleasing incident of the occasion was the presentation of a $500 solid silver loving cup to President Fred Enos of the Bridgeport Board of Trade, in recognition of his untiring energy in securing to Bridgeport so many new industries.—M. E. B. G.

NEWARK, N. J.

MAY 3, 1911.

Business with the manufacturing jewelers is a little quiet this spring, and buyers are slow in stocking up to any extent. However, an agreement among the jobbers throughout the country makes buying a little later this spring than usual. They have all agreed to not show new fall lines before the middle of May and spring lines not before December 26. Before, lines were shown at any time. This applies to manufacturers and jobbers, and most of them have agreed to it or will observe it. There is no objection to the new dates, although a few may pay no attention to them at all. As soon as all get used to it, things will work smoother.

One of the new firms to start in business is the Aluminum and Metal Specialty Manufacturing Company, at 46 Oliver street, with a capital stock of $25,000. They will manufacture high-grade aluminum staple goods and metal specialties, aluminum and brass castings, and will deal with the jobbing and manufacturing lines. The incorporators are: Christian Schmidt, J. B. Klausmann, Henry Brooker and O. B. Brooker. The Irving Manufacturing Company have opened a new and thoroughly up-to-date plant to manufacture 10 and 14-karat gold jewelry in the Shiman-Miller building. Irving Heidelsheimer, who was with Jonas Koch, of New York, and Louis H. Reiss, who was with Duram and Company, of this city, are the proprietors. A number of salesmen will be put on the road. The plant is perfectly arranged and shows some system.

The Murphy Foundry and Machine Company, of Asbury Park, who started in business to make aluminum and brass plumbing specialties and novelties, have now developed into making more auto accessories and parts.

The Elm Manufacturing Company have got to work again, Robert C. Dick being at the head of the new company, with L. M. Boaraem and G. E. Clymer. They will make a general 10-karat line at 391 Mulberry street.

James N. Morehous, who built up the firm of James N. Morehous, platers, and the Newark Plate Engraving Company, after being out of business now for a year, has started in again as the Morehous-Dalton Company, 34 Mechanic street. Will do all kinds of brass, nickel, copper and silver plating. They have the quarters of the Lockwood Company, who went out of business about a year ago. Frank C. Dalton is his partner.

Jeandheur Bros., of the Richardson building, claim they are the only firm here who have a workable process of platinum plating on any metal, except lead and aluminum. The process works all right and some very nice work is being done. John C. Blevney, who makes polishing machinery, has moved from 216 High street to 209 Parkhurst street. He has a new machine that will polish thirty-six feet of brass or other tubing in a minute. He has a much larger and more improved plant at the new location. The Stuber-Vanderelst Company is a new firm at 95 Oliver street, to succeed the Davis-Mason Company, with $100,000 capital stock, to make a general line of 10 and 14-karat gold jewelry. The firm is composed of John C. Stuber, late of the Stuber-Kraus Company, and Arthur C. Vanderelst, who was with Kautzman and Company. An entire new plant is being put in. The Newark Brass Works, brass finishers and sheet metal workers, have moved from 19 Mulberry street to 20 Lawrence street. They are making a new cellar drainer, a force pump and brazing blow pipes.

William Smith and Company, making gold chains at 405 Mulberry street, are in bankruptcy. They owe $118,000 and have assets of $18,000. Fred A. Schlosstein, of Schlosstein and Company, manufacturing jewelers, died at 248 Mt. Pleasant avenue. He was in business here since 1882. He left no will and all the property goes to the widow. The American Oil and Supply Company have moved their jewel and brush departments from 19 Liberty street and 23 Division place to 46 Green street, which they bought. It gives both factories more room and better facilities. The rest of the building will be used for storage purposes. Mr. Chenegros, of Chenegros and Company, gold, silver and bronze foundry, at 30 Franklin street, gave up business and went to Paris, France. The business is continued by Ernest J. Vatier, who was with him for seven years, and a high standard will be kept up for the jewelry and silverware trades.

The new firm of refining and smelters, Wolff-Trautz Company, are doing considerable sweep work and are making for the trade silver solders, silver alloys, gold and silver castings.—H. S.

BUFFALO, N. Y.

MAY 3, 1911.

The spring of 1911 in the industrial history of Buffalo is opening with a record of normal healthy growth of the metal business. While there has been no remarkable activity of business yet, at such plants as the Buffalo Copper and Brass Rolling Mills, the Fries Plating Company, business is slightly exceeding last year's at this same period.

Manufacturing jewelers report a normal business, and especially is there increased activity in the manufacture of novelty jewelry. Buffalo, the center of a great automobile trade, has fallen somewhat behind in the past year compared with the big boom of three years ago, yet the demand for automobile supplies keeps up to the average in other cities. Buffalo has gained many

industries during the past six months, among them that of the Otto Higel Company, Ltd., of Toronto, Canada, which comes here through the efforts of the Bureau of Industries of the Chamber of Commerce. This company will make a specialty of machinery for piano actions, player-piano actions, and has chosen Buffalo because of its nearness to Canada and its transportation facilities.

The most important event of the month was the first annual banquet of the Buffalo Foundry Foremen's Association, which was held at the Statler Hotel, at which more than 200 members were present. A boom was started at this meeting to secure the national convention of the American Foundrymen's Association for Buffalo in 1912.

The national president, R. F. Thompson, of Buffalo, gave the principal address, and Dr. Richard Moldenke, of Watchung, N. J., secretary of the American Foundrymen's Association, also spoke. Other speakers were William H. Barr, T. L. Richmond, W. M. Corse and W. F. Wendt. Much enthusiasm was displayed relating to the coming convention in Pittsburg, and it was stated that 4,000 foundrymen from different parts of the United States would be present at the 1911 convention. Buffalo is anxious to procure the 1912 convention, being invited by Frank W. Tracy, of the convention bureau of the Chamber of Commerce.

The demand for plumbing finishings has been strong. This has been a year of building industry in Buffalo, which has not been exceeded. Many churches and hotel additions have been and are in the process of building and the best of plumbing supplies are in constant demand. At the Lafayette Hotel fifty or more new bedrooms are being added, and the hotel is largely extended on its Ellicott street side. The Zander Plumbing Supply Company, occupying handsome quarters on Broadway, have completed contracts with local firms, showing that the summer and fall will be an active one in their business. Travelers for this firm also report an increased activity in orders.

Buffalo retail and wholesale jewelers have been pleased with the report which was just issued by the secretary of the Retail Merchants' Association, which shows that $304,543.88 has been spent in Buffalo by out-of-town purchasers in the year 1910. November was a banner month, recording money spent here amounting to $41,610.40. The refund scheme of the association has brought much trade to Buffalo through the association, the total refunds for 1910 being $14,080.48. The refunds are given on fares on purchases amounting to over $25.—McG.

CLEVELAND, OHIO

MAY 3, 1911.

With the advance of the spring months business with the metal producers in this territory continues to improve. Factories are now busy almost to capacity, and the outlook for an active summer is very good. The automobile factories, which handle vast quantities of brass, aluminum and copper in various forms, report an active demand all along the line. There seems to be no diminishing of the demand for machines. Cleveland manufactures all high grade machines and does not turn out the cheap runabouts made at many other points, but nevertheless the demand for the better class of machines is unusually active.

The big plumbing supply houses here are all busy getting out stock for spring and summer delivery. Building operations throughout the country are very active this year. In this particular territory the volume of permits for new buildings for every month so far this year are in excess of former seasons. Cleveland makes a heavy line of faucets and plumbers' goods of all kinds, which enter more each year into building operations, for few houses are now built without fully equipped bathrooms.

In the aluminum lines the foundries here all report a big demand for castings. Much of this comes from the automobile trade, though there is an increasing call each year from inventors of other machines, notably engines and airship equipments. The lightness, strength and comparative cheapness of aluminum are forcing it to the front in structural schemes where lightness is an essential element.

An unusually large and important contract for bronze lighting fixtures and standards was let during the past month by the County Building Commission when the Caldwell Company, of New York City was given the work of supplying fixtures for the new $4,000,000 county courthouse, the company's bid of $119,900 being accepted. Three other New York firms, The Enos Company, Mitchel, Vance & Company, and the Wahle Phillips Company, submitting bids. The work embraces all the chandeliers and sidelights for the building, as well as a number of big bronze standards for the exterior of the building, about $15,000 being allowed for the latter purpose. The bronze work is to be supplied from original sketches by Charles F. Schweinfurth, architect of Cleveland, who is in charge of the finishing of the monumental structure. The designs call for massive solid bronze fixtures with comparatively little decoration.

A new airship company has been launched in Cleveland and will begin shortly on the manufacture of a new line of air flyers. The concern is known as the Clark Airship Company, the incorporators being W. H. Clark, Jacob H. Levy, J. A. Bommhardt, W. G. Fording and E. J. Hobday. Clark has worked for eighteen years in perfecting a new screw and side propellor, the principle of which he has adapted for use in an airship. Considerable aluminum and similar metals enter into the construction of the new invention.

The National Electric Lamp Company, which is one of the largest lamp manufacturing concerns in the world, has bought thirty acres of land on Noble road, East Cleveland, and is preparing to spend $250,000 in the erection of six new office buildings and laboratories. The company will use the new location for its headquarters, moving its chemists, testers and office force there, but continuing its manufacturing plant in the same locality as at present.

A five-story white tile building, with a frontage of eight feet and about 200 feet on East 13th street, is to be built for Crowell & Hubbard, jewelers, as soon as the company's lease on its present store at Euclid avenue and East 6th street expires. The company operates one of the largest retail jewelry establishments in Cleveland. The Freeman Cooper Burial Vault Company has been incorporated with a capital of $10,000. The chief incorporator is J. W. Freeman, and the company's headquarters is at Columbus.—S. L. McM.

DETROIT, MICH.

May 3, 1911.

Detroit is experiencing at the present time one of the greatest booms in its history. It was thought one year ago that the city had reached a high water mark but conditions then were nothing compared to what they are now. Factories of every description are running to their fullest capacity. The automobile factories are unable to produce sufficient cars to meet the demand. There is not much wonder regarding the automobile industry when it is known that 45 per cent. of the machines sold in the United States are made in Detroit. The Packard, the Cadillac, Hudson, Ford, Chalmers, Regal, E. M. F., and all of the smaller concerns are turning out each day large numbers of machines that are shipped all over the world. Great quantities of brass are required in this work and as a consequence the factories that are producing this material have more than they can do. Many of the larger automobile factories have their own brass establishments, but even with this equipment large quantities of brass products used by them is obtained from independent concerns. There seems to be no let-up in the automobile industry in Detroit, and the indications are that this will be one of the greatest years for the manufacture of machines in the history of the city.

Great quantities of brass plumbing supplies are being used here this spring, to say nothing of the amount that is being manufactured and shipped all over the world. The majority of the brass manufacturing establishments are operating briskly and have orders ahead that will keep them busy the greater part of the summer and fall.

The Warren Motor Company has moved into the large new addition which it has erected at a large expense. This addition about doubles the floor space of the original Warren plant, and was built to allow the Warren Company to double its production. Mr. Wilson, the sales manager for this concern, states that before the summer is far advanced there will be a shortage among the medium-priced cars. He also said that the business was a little late in coming this spring, but it is now here with a rush; also, that the Warren cars are finding their way into the foreign markets. Recently a large number of his cars have been shipped to South America.—F. J. H.



TRADE NEWS



TRADE NEWS OF INTEREST DESIRED FROM ALL OF OUR READERS. ADDRESS THE METAL INDUSTRY, 99 JOHN STREET, NEW YORK

ADDITIONAL TRADE NEWS WILL BE FOUND UNDER "CORRESPONDENCE."

A new foundry, 83 by 159 feet, will be erected by the Buckeye Iron & Brass Works, Dayton, Ohio.

The Lakewood Metal Company, assayers and smelters of gold and silver, Lakewood, N. J., are expecting to soon build their own factory.

The Duplex Metals Company, producers of copper-clad steel, Chester, Pa., have installed wire-drawing machinery and will draw their copper-covered steel wire at their Chester plant.

The Howe Scale Company, manufacturers of scales, trucks, presses, electric coffee mills, etc., Rutland, Vt., expect to build a new foundry some time during the summer. At the present time details are not available.

The National Metal Reduction Company, 5305 Sweeney avenue, Cleveland, Ohio, are desirous of installing a zinc retort furnace and would like to have full information from the various manufacturers.

The Michigan Smelting & Refining Company, Detroit, Mich., have increased their capital stock by $100,000, which will be used in the erection of an entirely new plant. No new machinery will be required at the present time.

Plans have been completed by the Aluminum Goods Manufacturing Company, Manitowoc, Wis., for the construction of a factory building 300 by 400 feet, a power house of 300 horse power capacity and a service tower.

The General Manufacturing Company, C. F. Probst, president, 66 North Elm street, Waterbury, Conn., are planning to erect a new building at their present address. This company manufactures steel balls, rivets, studs and screws.

An addition, which will be used for a plating room, will soon be made to the International Silver Company's Factory B, which is located at Shelton, Conn. The equipment which the company expects to install has already been provided for.

The following officers were elected at the annual meeting of the Excelsior Brass Company, Reading, Pa.: Herbert E. Woodward, president; George Wicklein, vice-president; Henry Etheridge, treasurer; Louis M. Gantert, secretary.

C. H. Hughes & Co., engineers, of 82 Beaver street, New York, are incorporating their business and forming a stock company. For several years the company has been engaged in designing special automatic machinery and mechanical and electrical devices.

The New Jersey Zinc Company, New York, has decided to shut down all the smelter furnaces at their South Bethlehem, Pa., plant. The company will hereafter produce all their zinc oxide and spelter at the new plant at Palmerton, where several thousand men will be employed.

Frederic B. Stevens, manufacturer of foundry facings and supplies, polishers and platers' compositions, etc., of Detroit, Michigan, has recently furnished a complete polishing and plating plant for the Fireproof Furniture and Construction Company of Miamisburg, Ohio.

Daggett Galvanizing and Plating Company, electro-galvanizers, platers, polisers and manufacturers of soda holders, bottle tops and other novelties, Syracuse, N. Y., announce that they are now manufacturing novelties of all kinds and also that they are in shape to do soft metal casting.

The Spirella Company, manufacturers of corsets, Meadville, Pa., will move its plant to Niagara Falls, N. Y., where it will erect a $500,000 plant on a plot of four acres, located at the north end of the city. A branch factory will also be erected on the Canadian side of the river at Niagara Falls.

The Loeb Electro-Chemical Company, 467 Greenwich street, New York, has purchased all the assets of the Levett Manufacturing Company, manufacturers of polishers and platers' supplies, Mattawan, N. J., that were offered for sale by the receiver of the latter company.

Following a break with the United Metallic Cartridge Company, Hartford, Conn., the United Lead Company, Perth Amboy, N. J., has begun the manufacture of cartridges at its newly constructed plant. Over 100 girls are now working at the plant and eventually it is expected that not less than 500 will be employed.

The Waterbury Machine Company, manufacturers of wire machinery, Waterbury, Conn., which has been under the control of the Waterbury Farrel Foundry & Machine Company, Waterbury, Conn., for several years, has been merged into the latter company. The personnel of the business will not be affected by the change.

W. W. Wells, of Toronto, Ont., reports that his new factory at 368 Victoria street is ready for business. It is a three-story building, 46 x 30. Mr. Wells reports that he is the only firm in Canada making nickel anodes, and that he also manufactures buffing and polishing wheels and carries a complete line of platers' and polishers' supplies.

Leiman Brothers, with offices at 62-J John street, New York, and works at Newark, N. J., have recently installed in their plant a new 50 h. p. gas producer plant complete. They are adding to their line of light and heavy blowers a new 35 h. p. type and will eventually increase their line of heavy blowers with other sizes.

The Lorain Metal Products Company, manufacturers of finished products in metal, Lorain, Ohio, has recently been organized to consolidate the Stauder Foundry, the O'Brien Brass Works and B. R. Maddock's Pattern Shop. The company started operations on April 3, and report that the plants are running nicely and that the outlook for the future is good.

Specifications for supplies for the United States Assay Office are usually issued at about this time of the year, but so far none have been sent out this year from the New York office, as a new plan is under consideration at Washington which, if adopted, will place the awarding of contracts for all supplies valued at more than $10 in the hands of a central bureau at Washington.

The Legrand Bronze Company, manufacturers of bronze bushings, Plainfield, N. J., has acquired a site at the foot of 47th street, Bayonne, N. J. The first building of the new plant will be a one-story foundry, 40 by 80 feet, and will be equipped with cranes and eight furnaces. As soon as their new buildings are completed the plant and offices of the company will be moved from Plainfield.

A recent addition to the list of exhibitors at the Pittsburg meeting of the Foundry and Machine Exhibition Company, May 23 to June 1, is the Monarch Engineering & Manufacturing Company, manufacturers of Steele-Harvey crucible metal melting and refining furnaces, Baltimore, Md While the company will have 250 square feet of space they have not at this writing arranged the details relative to their exhibit.

The adjourned annual meeting of the stockholders of the Bristol Brass Company and of the American Silver Com-

pany, were held at the office of the Bristol Brass Company on Friday, February 24. The following board of directors was chosen for each company: Henry F. English, George W. Mitchell, Julian R. Holley, Samuel B. Harper, Roger S. Newell, Charles T. Treadway, Dean Welch, Charles W. Gross, Pierce N. Welch, Albert F. Rockwell and William S. Ingraham.

The Cleveland Platers' Supply Company of Cleveland, Ohio, have moved their offices to the new Engineers Building of that city, where they will be more centrally located to receive customers and friends. The firm has now entered the platers' supply field and carry a line of goods, including a new design polishing lathe, for which they have the exclusive sale. Their line of supplies will be added to from time to time until they have everything required by the plater and polisher. Their factory and warehouse is on Thirty-seventh street.

Secretary George S. Atwood, of the American Association of Commerce and Trade, Berlin, Germany, organized eight years ago for the purpose of aiding American manufacturers and business men in getting their goods into Germany and favorably placing the same, reports that the work of the association has been attended with gratifying results. The work of the association extends over the entire United States, and all Germany and American business men who will call upon the association for help will be promptly and satisfactorily answered.

The Philadelphia Foundrymen's Association has chartered a special Pullman car to run from Philadelphia to the convention at Pittsburg. The use of this car will be free to members and their friends. It will leave the Broad Street Station, Pennsylvania Railroad, Philadelphia, Pa., on Monday evening, May 22, at 9.02 o'clock, arriving in Pittsburg early on the morning of May 23. Some vacancies are still left and information regarding them can be secured from Howard Evans, secretary, care of J. W. Paxson Company, Philadelphia, Pa.

Divine Brothers Company, manufacturers of polishing wheels, Utica, N. Y., have increased their capital stock from $50,000 to $100,000 and have negotiated for an issue of bonds to the amount of $60,000, and will erect a new mill, which it is expected will be ready for occupancy about July 1. The new mill is to be a three-story and basement structure, 46 by 115 feet. The basement will be used for storage and the heating plant; the first floor will contain the superintendent's office and the receiving and shipping rooms, while the two upper floors will be given over to manufacturing.

The Apothecaries' Hall Company, Waterbury, Conn., announce that their business in platers' supplies is increasing rapidly. This concern long ago adopted the policy of analyzing all materials handled by them so that they know exactly what they are selling and are able to guarantee all their goods to be exactly as represented. Their laboratory is in charge of Dr. William Benedict, Ph. D., who for three years was instructor in chemistry at the Sheffield Scientific School, Yale University. L. Wilcox, who has charge of sales of platers and brass manufacturers' supplies, is also an experienced chemist, so that the company is well equipped to handle this class of business in a practical and satisfactory manner.

Proposals will be received at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., until 10 a. m., May 23, 1911, and publicly opened immediately thereafter to furnish at the navy yard, Mare Island, Cal., a quantity of naval supplies, as follows: Schedule 3521: Galvanized sheet, plate, and rod steel, brass and bronze rod, copper sheathing, slab and sheet zinc. Schedule 3523: Zinc boiler plates, sheet brass and copper, brass and copper pipe. Also at the navy yard Puget Sound, Wash. Schedule 3523: Sheet brass, galvanized iron and brass pipe. Blank proposals will be furnished upon application to the navy pay offices, San Francisco, Cal., and Seattle, Wash., or to the bureau.

Orrin E. Dunlap, secretary, reports that an agreement was entered into April 1 between the International Acheson Graphite Company, Niagara Falls, N. Y., and the Acheson Oildag Company, by virtue of which the first named company becomes the general agent in the United States for the sale of the lubricants Oildag and Aquadag. This means that the trade will in the future be supplied with oildag and aquadag by the International Acheson Graphite Company, which places this company in touch with the sale of lubricants that meet any and all needs, inasmuch as the company itself makes gredag, a lubricant which contains disintegrated Acheson-graphite and grease, while oildag is deflocculated Acheson-graphite and oil, and aquadag is deflocculated Acheson-graphite and water.

The J. W. Paxson Company, Philadelphia, Pa., are just completing a new building covering an area of about 4,500 square feet, which will be used partly for office purposes and partly for manufacturing and storage. The building is substantially constructed and has a saw-tooth roof which gives splendid lighting facilities. The company's wire cloth and riddle manufacturing department will occupy part of the new space. The Paxson Company do their own wire weaving by hand, which produces a wire cloth that for use in screens, riddles, etc., cannot be excelled. The brush manufacturing department will also be moved into the new building and the space formerly occupied used for storage purposes. The business of the brush department has been greatly increased on account of the large orders received from vacuum carpet-cleaner manufacturers. These cleaners require special brushes and the Paxson Company has been so successful in meeting their requirements that they have built up a large business in this line.

PARTING COMPOUND COMBINATION

Another effort is being made to get the manufacturers of parting compounds into combination by which they can sell partings at a living profit. On March 17, 1911, five of the eight manufacturers of parting compounds held a meeting in New York and while nothing definite resulted at the meeting, a movement was started to organize an association. The firms present and their representatives were the following: Stanley Doggett, New York; H. A. Roffman, Pettinos Brothers, Bethlehem, Pa.; Peerless Parting Company, Chicago, Ill.; A. Mann, Brooklyn Facing Mills, Brooklyn, N. Y.; A. Seaman, Central Foundry Supply Company, Columbus, Ohio. The absent companies were: The Foundry Specialty Company, of Cincinnati, Ohio; The Partomol Company, of New York, and the Buckeye Products Company, Cincinnati, Ohio.

At the meeting Pettinos Brothers produced a basic patent for the manufacture of parting compounds which would indicate that all other manufacturers were infringers. It is, therefore, thought possible that the various manufacturers may be brought together on the basis of a joint ownership or control of this patent. Another meeting of the producers interested is expected to be held in the near future.

BUSINESS TROUBLES

William Smith & Co., manufacturers of gold and silver chains at 9 and 11 Maiden Lane, one of the oldest houses in the jewelry trade, founded in 1854, have gone into bankruptcy, with liabilities $119,696 and assets $18,862. The petition in bankruptcy was filed by three of the partners, David N., Henry M., and Walter J. Smith. The other partner, Charles W. Smith, refused to join in the petition. He lives at 115 Lenox Road, Brooklyn.

CHANGE OF FIRM

The brass foundry business of L. H. Carter, Plainville, Conn., has been taken over by the Osborne & Stephenson Company of the same city, who have built an addition to their plant which will be used as a foundry, and will be equipped for four molders. The company have engaged Mr. Carter as foreman.

It has been announced that the firm of Theodore Hofeller and Company, rag, rubber, metal and paper dealers of Buffalo, N. Y., has been dissolved by mutual consent. The business will be continued by Theodore Hofeller as president with his son Eugene D. Hofeller as secretary and

treasurer. The company is incorporated for $200,000 and will carry out the policies of the old concern.

It is reported that a merger has beeen effected between the Somerville, Ltd., brass manufacturers, and the General Brass Manufacturing Company, Toronto, Canada. The capital of the former is $100,000 and the latter $75,000. The new company will be known as the United Brass and Lead Company. The following parties promoted the merger: A. F. Fuller, Chatham; Fred Somerville, Murray J. Woodbridge, L. M. Somerville, and Andrew J. Somerville, all of Toronto.

The Non-Corroding Metal Company, 50 Church street, New York, has been incorporated with a capital stock of $250,000, to take over the sole rights to the manufacture and sale of the metal Cupror. F. W. Barker is the general manager and he reports that the commercial success of Cupror has increased so rapidly that it necessitated the expansion of the company. A limited amount of the capital stock is offered to the public at $100 per share, and can be purchased at the sales office of the company. Cupror was fully described in the August, 1910, issue of THE METAL INDUSTRY.

REMOVALS

The U. S. Reduction Company has announced the removal of its general offices to 410-426 So. Clinton street, Chicago, Ill.

Alfred Fisher, inventor and manufacturer of the "Fisher" Oil Furnace, has moved his office and factory to 1447-1453 West Austin avenue, near Armour street, Chicago, Ill.

The Pittsburg Testing Laboratory, Pittsburg, Pa., are now located in their new building, corner Seventh and Bedford avenues, where they have better and more complete facilities for making analyses and tests of all kinds. The laboratories will be fitted up with the latest machinery and chemical apparatus.

The Finished Parts Manufacturing Company, Newark, N. J., manufacturers of die castings, has moved from 68 Orchard street, to 359 Mulberry street. This company was recently reorganized and incorporated, several New York City business men having become interested.

INCREASE OF CAPITAL STOCK

The capital stock of the Star Brass Works Company, Kansas City, Mo., from $10,000 to $30,000.

The Rochester Iron and Metal Company have increased their capital stock from $20,000 to $100,000.

DECREASE OF CAPITAL STOCK

The Trade Press reports that the Hawley Down Draft Furnace Company, manufacturers of the Schwartz and other melting and annealing furnaces, Chicago, Ill., have reduced their capital stock from $500,000 to $100,000, and the number of directors from seven to three.

INCORPORATIONS

Business organizations incorporated recently. In addressing them it is advisable to include also the names of the incorporators and their residence. Particulars of additional incorporations may frequently be found in the "Correspondence" columns.

CONNECTICUT BRASS COMPANY, Cheshire, Conn. Capital stock, $100,000. Incorporators: Michael E. Keeley, Michael Keeley and George J. Lines, all of Cheshire.

STANDARD GALVANIZING & MANUFACTURING COMPANY, Cleveland, Ohio. Capital stock, $15,000. Incorporators: Samuel G. Catchpole, G. T. Bander, E. W. Cheeltham, C. T. Denby and Victoria Cheeltham, all of Cleveland.

J. WATTERSON & COMPANY, LTD., Montreal, Canada. Capital stock, $150,000. To manufacture and deal in iron and metals. Incorporators: John Watterson, Westmount; E. B. Bustead, C. H. Buchanan, J. Strachan and H. A. Daniels, all of Montreal.

HUDSON METALLIC MANUFACTURING COMPANY, Ossining, N. Y. Capital stock, $10,000. To manufacture metal goods, electrical supplies. Incorporators: Robert M. Akin, Joseph Boyle, W. O. Higgins, all of Ossining. Officers: W. B. Maynard, president; A. T. Rutter, treasurer.

L. H. SNYDER & CO., INC., Bristol, Conn. Capital stock, $30,000. To manufacture sheet steel and brass goods. Incorporators: L. H. Snyder, Flora C. Snyder and Losee B. Snyder, all of Bristol.

ALUMINUM METAL & SPECIALTY MANUFACTURING COMPANY, Newark, N. J. Capital stock, $25,000. To manufacture aluminum and other metal specialties. Incorporators: C. Schmidt, J. B. Klausmann and Henry Brucker, all of Newark.

PRINTED MATTER

GENERATORS.—A complete description of the Allis-Chalmers generators and "ABC" engines is contained in Bulletin No. 1042, issued by the Power and Electric department, Allis-Chalmers Company, Milwaukee, Wis.

LACQUERS.—G. J. Nikolas & Company, manufacturers of lacquers, Chicago, Ill., have issued a handsome desk calendar made of stamped metal and finished with some of their verde green enamel lacquer. The calendar frame is 5 x 6½ ins. and furnishes a calendar good for 110 years, the life of the calendar being indicative of the superior lasting qualities of the Nikolas guaranteed lacquers.

METALS AND ALLOYS.—A comprehensive little booklet of thirty pages has been issued by the Electric Smelting & Aluminum Company, Lockport, N. Y., in the interest of their metals and alloys' products. Among the materials mentioned in the booklet are pure aluminum, nickel aluminum, aluminum zinc, aluminum bronze, aluminum solder, silicon copper, manganese copper, manganese bronze, silver bronze and babbitt metals. Copies of the booklet may be had upon request.

POLISHING COMPOSITIONS AND ROUGES.—The Hanson & Van Winkle Company, Newark, N. J., have published in their new Bulletin No. 122 some interesting explanations of the wide variations in quality and price of polishing compositions. The advice given for the use of these materials should prove of value to polishers. Bulletin No. 122 also contains full information regarding all grades of Tripoli, Crocus, Vienna Lime, Emery and other compositions, rouges, etc.

FILES.—The Nicholson File Company, manufacturers of files, Providence, R. I., have issued a 90-page catalogue giving complete descriptions and illustrations of the extensive line of files manufactured by them. The complete list of files made by this company include rough, coarse, bastard, second cut, smooth and dead smooth, universally known as increment cut files, which consists of a peculiar arrangement of the teeth which is secured to the company by letters patent. Copies of this catalogue will be sent by making application to Department F.

CLUTCHES.—The Carlyle Johnson Machine Company, Manchester, Conn., have issued catalog "E," a very attractive 36-page booklet describing the Johnson Friction Clutches. This clutch is small, powerful and simple in construction and has numerous other good features. It is extensively used for all the ordinary purposes for which clutches are employed and has been adopted and used extensively by a number of leading manufacturers of turret lathes and other metal working machinery as parts of their machines. 16,000 Johnson clutches have been used by one manufacturer of turret lathes alone, which speaks volumes for the reliability of this clutch. This catalog "E" will be sent free to anyone interested in machinery or clutches.

CATALOGUE EXHIBIT

An exhibition of every kind of catalogues may be seen at THE METAL INDUSTRY office, 99 John street, New York. THE METAL INDUSTRY is prepared to do all of the work necessary for the making of catalogues, pamphlets, circulars and other printed matter. Estimates will be furnished for writing descriptions, making engravings, printing, binding, for the entire job from beginning to end or any part of it.

AD NEWS

The Rockwell Furnace Company, 26 Cortlandt street, New York, feature in this issue their "Simplex" furnaces.

Smith & Richardson, Attleboro, Mass., advertise their "Imperial" polishing tank for polishing and burnishing small metal articles by means of steel balls.

The Carborundum Company, Niagara Falls, N. Y., have an attractive page advertisement which gives some interesting records accomplished with Carborundum grinding wheels on brass nuts and other articles.

The Sterling Wheelbarrow Company, West Allis, Wis., call attention to the advantages of using their flasks, which are made of special rolled sections of reinforced channel steel, which will not burn, break or spring.

Benjamin Middleditch, Detroit, Mich., invites foundrymen to send for his catalogue " T M I," which describes his tumbling barrels, sprue cutters, flasks, polishing machines, match plates and washing and grinding machines.

The Hanson & Van Winkle Company, Newark, N. J., who are the largest manufacturers of platers' and polishers' supplies and equipment, has taken extra space in which to advertise their polishing compounds, etc. These goods are fully described in their new Bulletin No. 122.

A. Allan & Son, 492 Greenwich street, New York, continue to advertise Allan metals. This concern has had twenty years experience in the manufacture of lead-copper and lead-copper-tin alloys and invite correspondence from concerns interested in these metals.

Kroeschell Brothers Company, 458 West Erie street, Chicago, Ill., invite attention to the Kroeschell-Schwartz Gyrating Flame Crucible Furnaces. Their advertisement quotes letters from several users of these furnaces to show their economy in oil consumption, etc.

The Brown Instrument Company, 307 Walnut street, Philadelphia, Pa., illustrate on the back cover an installation of Brown pyrometers at the United States Assay office, Wall street, New York. The Brown pyrometer was fully decribed in THE METAL INDUSTRY some time ago.

The Cleveland Platers Supply Company, Cleveland, Ohio, illustrate in this issue their "Cuyahoga" polishing machine and mention its principal features, and give full dimensions, etc. This company manufactures the well-known "Electric" Cleaning Compound, which is so extensively used.

The Turner Machine Company, 3632 North Lawrence street, Philadelphia, Pa., invite requests for their catalogue "J-II," which describes their labor saving foundry and finishing equipment, including sprue cutters, molding machines, sand sifters, flasks and the famous Turner automatic cock grinder.

The Buckeye Products Company, 2306-2312 Eastern avenue, Cincinnati, Ohio, manufacturers of foundry supplies and specialties, offers to send to foundrymen free samples of their Buckeye Parting, Okay Parting, Linco Core Compound, Buckeye Brass Flux, No. 777 Pure Ceylon Plumbago and Buckeye Core Wash.

The General Chemical Company, 712 Lafayette building, Philadelphia, Pa., have taken extra space in which to advertise their phosphorus in sticks and cakes for use in phosphor bronze, copper, etc., and their hydrofluoric acid for cleaning castings and other metal articles. They ship this acid in either barrels or carboys.

D. B. Moyer, Walled Lake, Mich., is advertising a full line of polishing, plating and buffing supplies. Mr. Moyer handles a line of goods manufactured by some of the most prominent concerns in the country. He calls attention particularly to his equipment and formula for producing gun barrel blue on steel and will be glad to send full particulars to those that will write him for pamphlet D.

The North American Smelting Company, Philadelphia, Pa., emphasize in this issue the quality of their metals and alloys and give a number of good reasons why foundrymen should use their phosphorus and manganese bronzes, ingot copper and brass, phosphorus copper, phosphorus tin, babbitt and type metals, solders, lead and block tin pipe. This company also makes bronze and brass castings.

The Manhattan Dental Company, Times building, New York, are advertising in this issue a substitute for platinum called Platinoid. This material is furnished in sheet, rod and wire, round or square. Platinoid is used largely in manufacturing spark plugs, electric contact parts, and dental supplies. The company will be glad to send their catalogue "B" and samples and quotations on request.

In the advertising pages of this issue is illustrated the Niagara Sand-Blast, a device which is sold for $15, and which does not necessitate the installation of cumbersome tanks and other expensive accessories. These sand-blasts will be sent on 10 days' trial and the purchase money refunded if it is not entirely satisfactory. Those interested can secure full information by addressing Dept. I, Niagara Device Company, Buffalo, N. Y.

The Hoyt Metal Company, 111 Broadway, New York, announce that they are successfully producing a two-ply Britannia metal, which is a substitute for the ordinary Britannia metal, and which they state effects a saving of about three hundred dollars per ton. They announce that the new substitute is made in sheets of all gauges and sizes, and in view of limited capacity they suggest the least possible delay in placing orders.

J. W. Paxson Company, Philadelphia, Pa., widely known as among the largest manufacturers and dealers in foundry equipment and supplies, are advertising their "Albany Sand" in this issue. The company owns and controls a large acreage of these sands and has an extensive fleet of boats in use, carrying from the banks. They employ regularly forty teams in Philadelphia and eighty teams outside of the city, nearly all engaged in hauling Albany Sand.

The Standard Rolling Mills, Inc., Brooklyn, N. Y., have decided to install an additional mill for rolling sheet Britannia, etc. This will enable them to take care of their increasing business in this line. The company recently commenced the manufacture of Duplex Britannia Metal, which consists of a layer of Britannia metal rolled with a backing of less expensive metal, and intended to be substituted for Britannia metal in products where only one side of the metal shows in the finished article.

INFORMATION BUREAU

Any firm intending to buy metals, machinery or supplies, and desiring the names of the various manufacturers and sellers of these products can obtain the desired information by writing to THE METAL INDUSTRY. Commercial questions are answered by return mail. Our Information Bureau is for the purpose of answering questions of all kinds. Address THE METAL INDUSTRY, 99 John street, New York.

METAL MARKET REVIEW

NEW YORK, May 8, 1911.

COPPER.

Standard Copper, in London, declined about £2 per ton during the month of April and closes within 7s. 6d. of the lowest prices reached since the break in 1907. Spot closed at £53 18s. 9d.

The figures as published by the Copper Producers' Association for the month of March were disappointing to the trade, owing to the heavy production and the small deliveries for home consumption; the total visible stocks increased over 5,000,000 pounds. During the month of April the exports have been very heavy, 27,466 tons, and it is predicted the home stocks will make a more favorable showing. Taken in conjunction with the European statistics of copper, the world's visible supply of copper is steadily decreasing. During the month of April, the visible supply in Europe decreased 6,710 tons, or over 15,000,000 pounds, according to this showing the copper situation is in pretty good shape.

The trouble with the market has been the poor demand from consumers. Heavy sales have been reported from Wall street, and the London standard market was run up £1 per ton. This London advance had all the ear-marks of the old-time manipulation, by handling interest on this side. The part that the trade could not understand was, that after these "Wall street sales" were reported, the leading interest reduced their price. With the trade in general and the iron and steel trade in particular absolutely stagnant, it does not seem plausible or probable that the larger consumers of copper bought as much of the red metal as Wall Street would have us believe.

The most important event to the trade during the month, was the decision of the Amalgamated people to sell "at the market" instead of piling up stocks while the smaller producers were getting the pick of the business.

The market is dull and the trend continues in buyers' favor. Lake 12.35, Electrolytic 12⅛, Casting 12 cents.

TIN.

The prediction of £200 in London for April tin did not materialize, the nearest was £196 10s. The opening was at £190, lowest £187, highest £196 10s. and closed at £193 10s.

The New York market has been through the usual fears and spasms. When the market looked absolutely good and every pound of tin offered had been taken, cables next morning were usually £2 or £3 down, and traders were kept guessing all the time with always a bullish sentiment predominating and a £200 market more or less in sight.

Statistically, the market is in very good shape, despite the small deliveries of only 3,300 tons for the month of April, after 5,100 tons in March. The total visible supply is only 14,441 tons, against 16,682 tons a month ago, and 17,932 tons a year ago.

The market today is around 42 cents and futures from 41½ to 41¾.

LEAD.

The London price hangs around £12 17s. 6d.

The New York market has been dull and easy, at around 4.45 New York, while the Trust price is supposed to be 4½ New York for 50-ton lots.

SPELTER.

The London price has been worked up to £24 2s. 6d., against £23 a month ago.

The New York market has ruled around 5.50 to 5.55 per carload lots for prompt shipment, while futures were freely offered 5.30 to 5.35.

ALUMINUM.

The market has been very dull with prices around 21 cents for ingots, 98-99% pure for ton lots of spot and future deliveries; smaller lots at 22 to 22¼.

ANTIMONY.

The foreign market is unchanged and the syndicate are reported as waiting for their rivals to unload before they take hold. Meanwhile the market is dull and rules in buyers' favor. Cookson's 9.40 to 9.50, Hallett's 9 cents, Chinese 8⅛, Hungarian grade 8¼.

SILVER.

Very little change in silver. London opened at 24 5-16 and closed at 24 9-16. New York market 52⅝ to 53¼ at the close.

QUICKSILVER.

The foreign price has sagged off again to £9 for Rothschild's price and second hands at £8 15s.

The wholesale price is $46.50 for carload lots, and jobbing lots at $47.50 to $48.00 per flask.

PLATINUM.

There has been no change in the price of platinum. Hard 10% iridium is quotable at $43.00 to $43.50, ordinary refined at $41.50. Iridium is quoted at $62.00 per ounce.

SHEET METALS.

There has been no change in the quoted list prices, but these prices are being shaded. Sheet is quotable at 16½ to 17 cents, base wire at 13¼ to 13½, base with brass products unchanged.

OLD METALS.

The saving feature of the old metal market continues to be the good demand from Europe. Home consumers are doing very little and prices generally are a shade lower than a month ago.

COPPER PRODUCTION

(Issued by the Copper Producers' Association.)

		May 8, 1911.
		POUNDS
Stocks of marketable copper of all kinds on hand at all points in the United States, April 1, 1911....		162,007,934
Production of marketable copper in the United States from all domestic and foreign sources during April, 1911.....		118,085,223
		280,093,157
Deliveries:		
For domestic consumption.....	52,407,650	
For export	62,129,599	
		114,537,249
Stocks of marketable copper of all kinds on hand at all points in the United States, May 1, 1911....		165,555,908
Stocks increased during the month of April.....		3,547,974

APRIL MOVEMENTS IN METALS

COPPER.	Highest.	Lowest.	Average.
Lake	12.50	12.25	12.40
Electrolytic	12.25	12.00	12.20
Casting	12.15	12.00	12.10
TIN	43.00	41.50	42.25
LEAD	4.50	4.45	4.50
SPELTER	5.55	5.50	5.50
ANTIMONY (Hallett's)	9.15	8.90	9.00
SILVER	.54	.52⅝	53.25

WATERBURY AVERAGE

The average price of lake copper per pound as determined monthly at Waterbury, Conn.

1910—Average for year 13.13½. 1911—January, 12⅞; February, 12¾; March, 12½; April, 12½.

INQUIRIES AND OPPORTUNITIES

Under our directory of "Trade Wants" (published each month in the back advertising pages), will be found a number of inquiries and opportunities which, if followed up, are a means of securing business. Our "Trade Want Directory" fills wants of all kinds. See Want Ad. pages.

Metal Prices, May 8, 1911

NEW METALS.

	Price per lb Cents.
COPPER—PIG, BAR AND INGOT AND OLD COPPER. Duty Free, Manufactured 2½c. per lb.	
Lake, carload lots	12.35
Electrolytic, carload lots	12.15
Casting, carload lots	12.00
TIN—Duty Free.	
Straits of Malacca, carload lots	42.00
LEAD—Duty Pigs, Bars and Old, 2½c. per lb.; pipe and sheets, 2⅜c. per lb.	
Pig lead, carload lots	4.45
SPELTER—Duty 1⅜c. per lb. Sheets, 1⅝c. per lb	
Western carload lots	5.50
ALUMINUM—Duty Crude, 7c. per lb. Plates, sheets bars and rods, 11c. per lb.	
Small lots	28.00
100 lb. lots	25.00
Ton lots	21.25
ANTIMONY—Duty 1½c. per lb.	
Cookson's, cask lots, nominal	9.50
Hallett's cask lots	9.00
Chinese	8.15
Hungarian grade	8.15
NICKEL—Duty Ingot, 6c. per lb. Sheet, strips and wire 35% ad valorem.	
Shot, Plaquettes, Ingots, Blocks, according to quantity	.43 to .60
MANGANESE METAL—Duty 20%	.90
MAGNESIUM METAL—Duty 3 cents per pound and 25% ad valorem (100 lb. lots)	1.50
BISMUTH—Duty free	2.10
CADMIUM—Duty free	.80
CHROMIUM METAL—Duty 25% ad val	.98
	Price per oz.
GOLD—Duty free	$20.67
SILVER—Duty free	.53⅜
PLATINUM—Duty free	42.00
QUICKSILVER—Duty 7c. per lb. Price per pound	.67

OLD METALS.

Dealers' Buying Prices. Cents per lb.		Dealers' Selling Prices. Cents per lb.
10.75 to 11.00	Heavy Cut Copper	11.75 to 12.00
10.50 to 10.75	Copper Wire	11.25 to 11.50
9.75 to 10.00	Light Copper	10.50 to 10.75
9.25 to 9.50	Heavy Mach. Comp	10.25 to 10.50
7.00 to 7.25	Heavy Brass	8.00 to 8.25
5.50 to 5.75	Light Brass	6.75 to 7.00
7.00 to 7.25	No. 1 Yellow Brass Turnings	7.75 to 8.00
8.00 to 8.25	No. 1 Comp. Turnings	8.75 to 9.00
3.90 to 4.00	Heavy Lead	—— to 4.25
3.75 to 3.90	Zinc Scrap	—— to 4.25
5.00 to 5.50	Scrap Aluminum, turnings	5.00 to 6.50
10.00 to 12.00	Scrap Aluminum, cast, alloyed	11.00 to 13.00
14.00 to 15.00	Scrap Aluminum, sheet (new)	16.00 to 17.50
23.00 to 24.00	No. 1 Pewter	25.00 to 26.00
25.00 to 27.00	Old Nickel	28.00 to 30.00

INGOT METALS.

	Price per lb. Cents.
Silicon Copper, 10% to 20% ..according to quantity	28 to 35
Silicon Copper, 30% guaranteed " "	38
Phosphor Copper, 5% " "	19 to 21
Phosphor Copper, 10% to 15%, guaranteed " "	28 to 30
Manganese Copper, 30% " "	30 to 35
Phosphor Tin " "	34 to 36
Brass Ingot, Yellow " "	8½ to 9½
Brass Ingot, Red " "	11 to 12½
Bronze Ingot " "	10 to 11
Manganese Bronze " "	17 to 19
Phosphor Bronze " "	13 to 16
Casting Aluminum Alloys " "	29 to 35
PHOSPHORUS—Duty 18c. per lb. According to quantity	30 to 35

PRICES OF SHEET COPPER.

BASE PRICE, 18 Cents per Lb. Net.

PRICES MENTIONED BELOW ARE FOR QUANTITIES OF 100 LBS. AND OVER.

SIZE OF SHEETS.		64 oz. and over 50 lb. sheet 30 x 60 and heavier.	32 oz. to 64 oz. 25 to 50 lbs. sheet 30 x 60.	24 oz. to 32 oz. 18¾ to 25 lb. sheet 30 x 60.	16 oz. to 24 oz. 12½ to 18¾ lb. sheet 30 x 60.	14 oz. and 15 oz. 11 to 12½ lb. sheet 30 x 60.	12 oz. and 13 oz. 9½ to 11 lb. sheet 30 x 60.	10 oz. and 11 oz. 7⅞ to 9⅛ lb. sheet 30 x 60.	8 oz. and 9 oz. 6¼ to 7⅜ lb. sheet 30 x 60.	Lighter than 8 oz.
		Cents Per Pound Over Base Price for Soft Coppers								
Not wider than 30 ins.	Not longer than 72 inches.	Base	Base	Base	Base	1	2	3	6	9
	Longer than 72 inches. Not longer than 96 inches.	"	"	"	"	1	3	6	9	
	Longer than 96 inches.	"	"	"	"	2	6			
Wider than 30 ins. but not wider than 36 inches.	Not longer than 72 inches.	"	"	"	"	2	4	7	10	
	Longer than 72 inches. Not longer than 96 inches.	"	"	"	"	2	6	9		
	Longer than 96 inches. Not longer than 120 inches.	"	"	"	1	3				
	Longer than 120 inches.	"	"	1	2					
Wider than 36 ins. but not wider than 48 inches.	Not longer than 72 inches.	"	"	1	2	4	7	10		
	Longer than 72 inches. Not longer than 96 inches.	"	"	1	3	5	8			
	Longer than 96 inches. Not longer than 120 inches.	"	"	2	4	8				
	Longer than 120 inches.	"	1	3	6					
Wider than 48 ins. but not wider than 60 inches.	Not longer than 72 inches.	"	Base	1	3	6	11			
	Longer than 72 inches. Not longer than 96 inches.	"	"	2	4	9				
	Longer than 96 inches. Not longer than 120 inches.	"	1	3	6					
	Longer than 120 inches.	1	2	4	8					
Wider than 60 ins. but not wider than 72 ins.	Not longer than 96 inches.	Base	1	3	8					
	Longer than 96 inches. Not longer than 120 inches.	"	2	5	10					
	Longer than 120 inches.	1	3	8						
Wider than 72 ins. but not wider than 108 ins.	Not longer than 96 inches.	1	3	6						
	Longer than 96 inches. Not longer than 120 inches.	2	4	7						
	Longer than 120 inches	3	5	9						
Wider than 108 ins.	Not longer than 132 inches.	4	6							
	Longer than 132 inches.	5	8							

The longest dimension in any sheet shall be considered at its length.

CIRCLES, SEGMENTS AND PATTERN SHEETS, advance over prices of Sheet Copper required to cut them from 3 cents per pound.

COLD OR HARD ROLLED COPPER, 14 oz. per square foot, and heavier, add 1 " " "

COLD OR HARD ROLLED COPPER, lighter than 14 oz., per square foot, add 2 " " "

POLISHED COPPER, 20 INCHES WIDE and under, advance over price for Cold Rolled Copper of corresponding dimensions and thickness 1 " " sq. ft.

POLISHED COPPER, WIDER THAN 20 INCHES, advance over price for Cold Rolled Copper of corresponding dimensions and thickness 2 " " " "

COLD ROLLED COPPER, PREPARED SUITABLE FOR POLISHING, same as Polished Copper of corresponding dimensions and thickness.

COLD ROLLED AND ANNEALED COPPER SHEETS OR CIRCLES, same price as Cold or Hard Rolled Copper of corresponding dimensions and thickness.

ROUND COPPER ROD, ⅜ inch diameter or over ..... Base Price.

(Rectangular, Square and Irregular Shapes, Copper Rod, Special Prices.)

ZINC—Duty, sheet, 1½c. per lb.	Cents per lb.
Carload lots, standard sizes and gauges, at mill	7.25 less 8%
Casks, jobbers' prices	8.00
Open casks, jobbers' prices	8.50

Metal Prices, May 8, 1911

PRICES ON BRASS MATERIAL—MILL SHIPMENTS,

In effect Jan. 30, 1911, and until further notice.

To customers who purchase less than 40,000 lbs. per year and over 5,000 lbs. per year.

	Net base per lb. High Brass.	Low Brass.	Bronze.
Sheet	$0.13¼	$0.14⅞	$0.15⅝
Wire	.13¼	.14⅞	.15⅝
Rod	.13¼	.15⅝	.16⅜
Brazed tubing	.18⅜	——	.20¼
Open seam tubing	.16⅜	——	.18¼
Angles and channels, plain	.16⅜	——	.18¼

50% discount from all extras as shown in American Brass Manufacturers' Price List No. 8.

NET EXTRAS FOR QUALITY.

Sheet—Extra spring drawing and spinning brass...	½c.	per	lb.	net	advance
" —Best spring, drawing and spinning brass....	1½c.	"	"	"	"
Wire —Extra spring and brazing wire.....	½c.	"	"	"	"
" —Best spring and brazing wire.....	1c.	"	"	"	"

To customers who purchase less than 5,000 lbs. per year.

	Net base per lb. High Brass.	Low Brass.	Bronze.
Sheet	$0.14¼	$0.15⅞	$0.17⅝
Wire	.14¼	.15⅞	.18⅝
Rod	.14¼	.16⅝	.19⅜
Brazed tubing	.19⅜	——	.21½
Open seam tubing	.17⅜	——	.19½
Angles and channels, plain	.17⅜	——	.19½

5% discount from all extras as shown in American Brass Manufacturers' Price List No. 8.

NET EXTRAS FOR QUALITY.

Sheet—Extra spring drawing and spinning brass...	½c.	per	lb.	net	advance
" —Best spring, drawing and spinning brass....	1½c.	"	"	"	"
Wire —Extra spring and brazing wire.....	½c.	"	"	"	"
" —Best spring and brazing wire.....	1c.	"	"	"	"

BARE COPPER WIRE—CARLOAD LOTS.

13.75c. per lb. base.

SOLDERING COPPERS.

300 lbs. and over in one order.....17½c. per lb. base
100 lbs. to 300 lbs. in one order.....18c. " " "
Less than 100 lbs. in one order.....19½c. " " "

PRICES FOR SEAMLESS BRASS TUBING.

From 1¼ to 3½ in O. D. Nos. 4 to 13 Stubs' Gauge, 18c. per lb.
Seamless Copper Tubing, 21c. per lb.

For other sizes see Manufacturers' List.

PRICES FOR SEAMLESS BRASS TUBING Iron Pipe Sizes.

Iron pipe Size	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6
Price per lb.	26	25	20	19	18	18	18	18	18	18	18	19	20	22	24	25

PRICE LIST OF IRON LINED TUBING—NOT POLISHED.

	Per 100 feet Brass.	Bronze.
⅜ inch	$8	$9
½ inch	8	9
⅝ inch	10	11
¾ inch	12	13
⅞ inch	14	15
1 inch	18	20
1⅛ inch	22	24
1¼ inch	25	27
1½ inch	32	35
1¾ inch	45	48
2 inch	56	60

Discount 55 and 5%.

PRICES FOR MUNTZ'S METAL AND TOBIN BRONZE.

Muntz's or Yellow Metal Sheathing (14" x 48")	14c.	net base
" " " Rectangular sheets other than Sheathing	16c.	" "
" " " Rod	14c.	" "
Tobin Bronze Rod	16c.	" "

Above are for 100 lbs. or more in one order.

PLATERS' METALS.

Platers' bar in the rough, 22¼c. net.

German silver platers' bars dependent on the percentage of nickel, quantity and general character of the order.

Platers' metal, so called, is very thin metal not made by the larger mills and for which prices are quoted on application to the manufacturers.

PRICES FOR SHEET BLOCK TIN AND BRITANNIA METAL.

Not over 18 in. in width, not thinner than 23 B. S. Gauge, 2c. above price of pig tin in same quantity.

Not over 35 in. in width, not thinner than 22 B. S. Gauge, 3c. above price of pig tin.

PRICE SHEET FOR SHEET ALUMINUM—B. & S. Gauge.

Wider than..... and including.....	3in. 12in.	6in. 14in.	14in. 16in.	16in. 18in.	18in. 20in.	20in. 24in.	24in. 30in.	30in. 36in.	36in. 40in.
	in coils.								
No. 13 and heavier	34	34	36	36	36	36	39	39	39
" 14	34	34	36	36	36	36	39	39	39
" 15	34	34	36	36	36	36	39	39	39
" 16	34	34	36	36	36	36	39	39	39
" 17	34	34	36	36	36	36	39	39	39
" 18	34	34	36	36	36	36	39	39	42
" 19	34	34	36	36	36	36	39	40	43
" 20	34	36	36	36	36	38	41	42	44
" 21	34	38	38	38	38	40	43	44	50
" 22	34	38	38	38	40	40	43	47	51
" 23	34	38	38	38	40	40	43	49	52
" 24	34	38	40	42	42	42	45	51	54
" 25	36	39	41	43	43	43	46	53	57
" 26	36	39	42	46	46	46	51	55	61
" 27	36	40	44	48	48	49	54	58	64
" 28	36	40	46	48	49	49	56	62	67
" 29	38	41	48	50	52	52	61	67	72
" 30	38	42	50	52	56	62	69	72	77
" 31	43	47	55	58	63	71	74	77	83
" 32	45	49	57	61	69	77	91	90	95
" 33	47	51	60	65	73	84	91	100	110
" 34	50	55	62	70	78	91	103	110	120
" 35	..	65	70	80	90	100	115	125	..
" 36	..	80	90	100	115	120	135	..	..
" 37	..	104	114	129	144	159	174	..	..
" 38	..	124	139	154	169	184	204	..	..
" 39	..	144	164	184	204	224	..	..	..
" 40	..	174	204	224	244	..	..	..	..

In flat rolled sheets the above prices refer to lengths between 2 and 8 feet. Prices furnished by the manufacturers for wider and narrower sheet. All columns except the first refer to flat rolled sheet. Prices are 100 lbs. or more at one time. Less quantities 5c. lb. extra. Charges made for boxing.

PRICE LIST SEAMLESS ALUMINUM TUBING.

STUBS' GAUGE THE STANDARD. SIZES CARRIED IN STOCK.

Outside Diameters. BASE PRICE, 25 Cents per Pound.

Stubs' Gauge.	Inches.	¼ in.	5-16 in.	⅜ in.	½ in.	⅝ in.	¾ in.	⅞ in.	1 in.	1¼ in.	1½ in.	1¾ in.	2 ins.	2½ ins.	3 ins.	3½ ins.	4 ins.	4½ ins.
11.	.120.	..	..	..	..	..	..	..	27	24	..	..	14	20	10	9	16	23
12.	.109.	..	..	..	..	..	..	..	26	..	..	..	15	..	..	..	..	..
14.	.083.	..	..	..	..	..	..	..	..	..	..	..	17	..	..	..	..	..
16.	.065.	..	..	..	..	..	28	27	27	24	23	21	21	21	21	27	31	37
18.	.049.	..	..	..	..	33	30	29	28	25	26	26	26	..	..	..	..	..
20.	.035.	117	..	46	39	34	33	32	30	29	30	30	30	31	38	49	58	81
21.	.032.	..	..	..	40	..	..	..	..	..	..	..	..	..	..	..	..	..
22.	.028.	138	98	48	42	38	37	35	34	..	..	45	..	..	..	..	..	..
24.	.022.	188	133	108	88	79	73	62	60	66	..	..	..	..	..	..	..	..

Prices are for ten or more pounds at one time. For prices on sizes not carried in stock send for Manufacturers' List.

PRICE LIST FOR ALUMINUM ROD AND WIRE.

Diameter. B. & S. G'ge.	000 to No. 10.	No. 11.	No. 12.	No. 13.	No. 14.	No. 15.	No. 16.	No. 17.	No. 18.	No. 19.	No. 20.	No. 21.	No. 22.
Price, per lb....	32	32½	32½	33	33½	34	34½	35	36	37	38	43	46

PRICE LIST FOR GERMAN SILVER IN SHEETS AND ROLLS.

Per cent.	Price per lb.	Per cent.	Price per lb.
12	$0.52	16	$0.58
13	.53	17	.59
14	.54	18	.60
15	.55		

These prices are for sheets and rolls over 2 inches in width, to and including 8 inches in width and to No. 20, inclusive. American or Brown & Sharpe's Gauge. Prices are for 100 lbs. or more of one size and gauge in one order. Discount 50%.

GERMAN SILVER TUBING.

4 per cent.	to No. 19,	B. & S.	Gauge,	inclusive	$0.60
6 "	" 19,	"	"	"	.70
9 "	" 19,	"	"	"	.85
12 "	" 19,	"	"	"	1.00
15 "	" 19,	"	"	"	1.15
16 "	" 19,	"	"	"	1.20
18 "	" 19,	"	"	"	1.50

German Silver Tubing thinner than No. 19 B. & S. Gauge add same advances as for Brazed Brass Tube.

For cutting to special lengths add same advances as for Brazed Brass Tube. Discount 40%.

PRICES OF SHEET SILVER.

Rolled sterling silver .925 fine is sold according to gauge quantity and market conditions. No fixed quotations can be given, as prices range from 2c. below to 6c. above the price of bullion.

Rolled silver anodes .999 fine are quoted at 2c. to 3½c. above the price of bullion.

ALUMINUM COMPANY OF AMERICA

PITTSBURGH, PA.

ALUMINUM

SHEET TUBING
EXTRUDED SHAPES
ROD RIVETS WIRE
ELECTRICAL CONDUCTORS

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BOSTON—131 State St.
ROCHESTER—406 Powers Block
CHICAGO—Old Colony Bldg.
CLEVELAND—719 Garfield Bldg.
PITTSBURGH—2344 Oliver Bldg.
WASHINGTON—514 Nat. Met. Bk. Bldg.
DETROIT—1515 Ford Bldg.

A Substitute for Britannia

After many years of experimenting we have been successful in producing a two-ply Britannia Metal which is designed especially for stamped goods, such as brush and mirror backs, casket name-plates, etc.

This material costs about three hundred dollars per ton less than an equal grade of Britannia Metal.

As you can well imagine, our business in this line is growing rapidly, and in view of limited capacity we suggest the least possible delay in placing trial orders.

HOYT METAL COMPANY
NEW YORK ST. LOUIS

Four Indisputably Good Reasons Why

it will be to your interest to use our Metals and Alloys:

1. We put only the *right kind* of material into our products.
2. Two generations of experienced metal men are behind them.
3. Our smelting and manufacturing facilities are unexcelled.
4. We are centrally located with splendid shipping facilities.

All this enables us to give you the best quality at lowest prices in any of the following lines:

Phosphor Bronze
Anti-Acid Bronze
Climax Bronze
Manganese Bronze

Bronze and Brass Castings
Ingot Copper Ingot Brass
Phosphor Copper
Phosphor Tin

Babbitt, Type, Linotype and Stereotype Metal
Tinners' and Brazing Solders
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PHILADELPHIA, PA.
Established 1865

STANDARD ROLLING MILLS INC.

365 Hudson Avenue, Brooklyn, N. Y.

MANUFACTURERS OF

STANDARD BRITANNIA METAL

PROGRESSIVE MANUFACTURERS of Metal Goods, such as hollow-ware, brush, comb and mirror backs; trays, novelties, badges, medals, etc., can find many profitable uses for **Britannia Metal,** which for many purposes is better than brass, copper or German silver. **Britannia Metal** does not corrode or tarnish. It stays white in places where even German silver turns yellow. It is easily plated with any desired finish. It is easily worked and needs no annealing. It necessitates only inexpensive cast bronze dies, which wear long, seldom break and have a high scrap value when worn out. Though soft, **Britannia Metal** holds its shape perfectly after being formed. It is easily soldered. We re-roll **Britannia Metal** scrap at a nominal charge, or will purchase it outright from you. These advantages should induce you to write for quotations.

WE ALSO MAKE

DUPLEX BRITANNIA METAL

CHROMAX BRONZE

PATENTED

The only Bronze for Bearings, Gears, Propeller Wheels, etc. Positively non-corrosive and acid-proof. Possesses very oily nature.
Tested out by the U. S. Government.
Samples on request.

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All kinds of brass and aluminum castings. Brazing solder of all kinds.

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To save, separate and recover them:
This is our business
Write our Dept. A. Tell us of your problem.
Our twenty years experience will probably help you.

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Joplin, Mo.

Philadelphia, Pa., Weightman Bldg.
Birmingham, Ala., Brown-Marx Bldg.

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Our Ingot is prepared by the most up-to-date methods, which insures good, free-flowing metal. Send us your specifications and we will quote you prices which are sufficiently below the cost of making the same composition from new metals, that a material saving can be effected. We are in position to do this, as we have our own smelters. Our Ingots are guaranteed subject to chemical analysis within 1% either way of aimed-at formula.

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BIRMINGHAM, ALA.

CUPROR

TRADE MARK

The new metal that looks like gold and wears like steel. *Absolutely won't corrode.* Resists the action of the atmosphere, salt air and salt water. *Color and lustre permanent.* Great strength, toughness and ductility. *The easiest metal to work known.* Can be had either soft or of hard spring temper. For fittings of all kinds. *No lacquer required. Easily cleaned with soap and water.* Some of its principal uses are: for jewelry, bedsteads, automobile fittings, ship's fittings, building hardware, furniture trimmings, railroad car fittings, lamps, lavatory fittings, chandeliers, etc. In ingots, sheet, wire, tubing and rods.

JAMES SAVAGE & COMPANY, *Brass Founders, Brooklyn, N. Y., wrote:* "It is the most wonderful metal of the non-ferrous class. I cast a rod ¼" x 12" long, and you can forge and bend it in any way you desire. Two expert molders paid me a visit, and I showed them the new metal and torsion test I made, and they admitted they had no mixture that would come near the test I made. It turns on the lathe like steel, and you can hammer it to a razor edge."

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Cables, Pamphlet, New York

THE NON-CORRODING METAL CO.
50 Church Street, New York

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ALUMINUM SOLDER

IS THE ONLY REAL RELIABLE
ALUMINUM SOLDER
A SAMPLE ORDER WILL PROVE IT

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PHILADELPHIA, PA.

Aluminum Solder **No Flux**

Mass. Institute of Technology, test 11,090 lbs. per sq. inch at soldered joint

WE HAVE THE STRENGTH

$100 REWARD

FOR ANY BROKEN PIECE OF ALUMINUM WE FAIL TO REPAIR SATISFACTORILY WITH OUR SOLDER

Solder $3.00 per lb. **Sample Sticks $1.00**

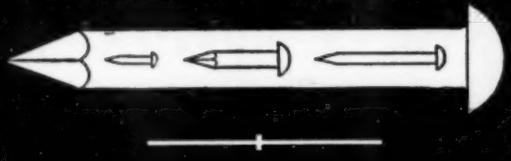
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AGENTS WANTED
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134 W. 49th St., N.Y.

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IRON, BRASS, COPPER
GERMAN SILVER, ALUMINUM, ETC.
AND
PLATED IN ANY FINISH
HAVE MADE THEM SINCE 1850

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CLAY & OAKLAND STREETS,
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WHEW!!
LOOK AT TIN!!

NOW is the time to order
100 pounds of

BASSITE

and find out just what it will do for you toward saving 40% of the price of tin. You have the strength and quality test reports, or we will send them on application.

BUT ORDER NOW

The Bassite Smelting & Mfg. Co., Inc.
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The Manufacturers of **Reinhold Noflux Aluminum Solder, Reinhold Combination Solder, Reinhold Die-Casting Solder and Reinhold Special Noflux Aluminum Solder** beg to announce that on account of extensive laboratory improvements they have been enabled **to reduce the price** of the above products to

$2.80 PER POUND

For Trade Discount Apply to Your Jobber or to

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53 DEMAREST STREET, NEWARK, NEW JERSEY

The One Great Advance in the Soldering Industry

A-S-P SOLDERING FLUID

NO ACID NO FUMES NO RUST

Saves the Health of the Metal Worker
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The Fluid that displaced rosin for roofing

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THE ALFRED SPICE PROCESS
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(A Substitute for Platinum.)
In Sheet or Wire, Round or Square.
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BOOKS ON PLATING
ARTICLES ON ALL RELATED SUBJECTS

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FOUNDED 1842

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For any purpose

CHEMICAL APPARATUS
CRUCIBLES
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Platinum Alloys, Salts and Solutions

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SOLE AGENTS FOR ALL FRENCH PRODUCERS

High Grade MANGANESE-COPPER Free From Iron

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Bronze Liquid for Mixing the Powder
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INGOT, PLATE, SHEET, ROD, WIRE, TUBE, METAL GOODS.

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Manufacturers of

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SEAMLESS DRAWN BRASS AND COPPER TUBING

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Copper and Yellow

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NAVAL BRASS
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PLATES, SHEETS, BOLTS, BARS, RODS,
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Manganese
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"BRIDGEPORT" BRONZE ROD
PHONO-ELECTRIC WIRE

For Trolley, Telephone and Telegraph Lines

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Manufacturers

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German Silver

Brass, Copper and Bronze in Sheets, Wire, Rods and Tubes

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TUBING FOR ELECTRICAL PURPOSES

Odd and Special Shapes, and Small Tubing a Specialty

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All Sizes from 8 to 36, B. & S. Gauge.

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GERMAN SILVER

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Sheets, Rods, Wire, Ingots, Castings, Jewelers' Bars and Alloys.

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From 4 in. Diameter to 1-64 in.
Finished Bright, Smooth and Accurate to 1-1000 Ins. Inside and Out
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Gold Solder
SHEET OR WIRE
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SHEET OR WIRE
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Special Sizes of Zinc to order. Rolled Battery Plates. Selected Plates for Etchers' and Lithographers' use. Selected Sheets for Paper and Card Makers' use. Stove and Washboard Blanks.

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Dealers in New and Old Metals, and the Largest Buyers of Zinc Dross, Skimmings, Sal Skimmings, Scrap Zinc and Aluminum

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HEAVY COPPER AND WIRE, Ready for the Crucible
COMPOSITION, Carefully Selected
HEAVY YELLOW BRASS, Free from Iron
OLD METALS GENERALLY



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Write me to-day for attractive prices in large and small quantities. Only 98 per cent. and 99 per cent. handled. Can be used for all purposes. 250 tons per month.

HIGH GRADE
Copper
Composition
Yellow
INGOT
Copper
Composition
Yellow
WHITE & BRO., Inc.
Station K, Philadelphia, Pa.

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Guaranteed Stock
Double Refined Spelter and Solder
Buyers of Drosses, Skimmings, Scrap and Turnings
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are caused by the gases absorbed in the melting, and our Magnesium is the best Agent for the elimination of the said gases, thus removing the CAUSE of "blow-holes," and furnishing the means for production of First-Class Castings.
Always Specify "LEAVITT'S MAGNESIUM
C. W. LEAVITT & CO.
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. . . Dealers in . . . METALS
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Gold and Silver Refiners
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Full value paid for any material containing Gold, Silver and Platinum
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CINCINNATI, OHIO
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TYPE METALS
BRASS INGOTS
METALS
INGOT COPPER
ALUMINUM
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LEAD TIN
Sole Manufacturers of KANSAS SELECT DOUBLE REFINED SPELTER (Best for Brass Foundries)



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The Light Manufacturing and Foundry Company

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Are the Original and only Manufacturers of

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ALUMINUM CASTINGS

Our Aluminum Castings are especially adapted to Automobile, Auto Boat and Aerial Construction.

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HIGH GRADE BRASS, BRONZE, GERMAN SILVER AND COMPOSITION CASTINGS

For all purposes, Finished or in the rough. To Order and on Contract from Customer's Patterns.



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See Page 55

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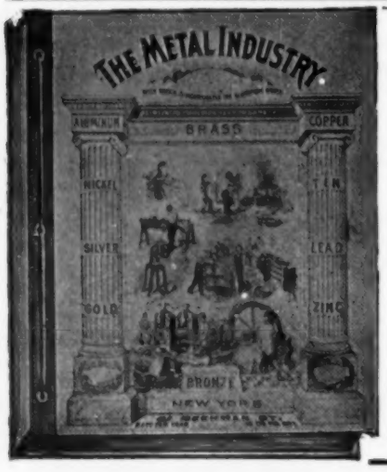
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AN EXCHANGE FOR THE WANTS OF THE METAL TRADES

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FOR SALE—American Gas Furnace No. 5. Regular melter for No. 20 crucible and No. 1 positive pressure blower. Practically new. Will sell at a bargain. JOHN MEINHART, 118 E. 12th street, Cincinnati, Ohio.

FOR SALE—A No. 2 Type M DINGS SEPARATOR FOR BRASS FOUNDRY use. We guarantee the machine to be in perfect condition, and if taken at once can be bought for $145. Factory price, $250. For full information, address MILWAUKEE EQUIPMENT COMPANY, Milwaukee, Wis.

FOR SALE—The metal working machinery used in the factory of the Manhattan Screw & Stamping Works. THOMAS A. PAINTER, West End avenue and 67th street, New York.

FOR SALE—11,000 lbs. SEAMLESS COPPER TUBES, 7/16 in. to 2¼ ins. O. D.; various gauges and lengths. Address L. LAPAT, INC., Erie street and Erie Railroad, Paterson, N. J.

J. P. FANNING, machinist, 678 Jefferson avenue, Brooklyn, N. Y.—Maker of Moulds for Casting Solder, Babbitt Metal, Bar Lead, etc. We also manufacture small work. Write for particulars.

PLANTS

FOR SALE—Small METAL MELTING PLANT adapted for experimental work on ALLOYS of COPPER, NICKEL, etc. Absolute privacy. Maximum furnace capacity, 35 crucible. Location, Jersey City, N. J. Monthly rent, $4. Make offer. Address JERSEY CITY, care THE METAL INDUSTRY.

FOR SALE OR LEASE—BRASS AND ALUMINUM FOUNDRY in Indianapolis, Ind. Thoroughly modern in equipment and appliances. Did a business in its last year of nearly $200,000.00. Second largest automobile center in United States. Nearly thirty auto factories in city and vicinity. Great quantities of brass and aluminum castings required here and within a radius of one hundred miles. Present owner engaged in other business requiring his time. Address F. E. JANES, care F. E. JANES COAL & GRAIN COMPANY, INDIANAPOLIS, IND.

FOR SALE.—BRASS FOUNDRY in Brooklyn, N. Y., fully equipped and running at the present time. Good line of paying business. Owner engaged in other business requiring his time. Address X Y Z, care THE METAL INDUSTRY.

FOR SALE—PLATING and POLISHING SHOP, the only one in city. At the present time doing good business. Reason for selling, other business. Cheap to quick buyer. Address PLATING SHOP, care THE METAL INDUSTRY.

FOR SALE—A fully equipped ELECTRO-PLATING PLANT in large western city. Established four years. Profits from $175 to $200 per month. Price $2,000 if taken at once. Terms $1,200 down, balance to suit buyer. Reason for selling, death of owner. Address H. B. B., care THE METAL INDUSTRY.

FOR SALE—ELECTRO-PLATING PLANT doing a good business in the heart of the city of Boston. Good reasons for selling. WINTHROP PLATING COMPANY, 34 Beach street, Boston, Mass.

FOR SALE—Good paying BRASS MANUFACTURING ORNAMENTAL METAL and PLATING WORKS; fully equipped; long lease; cheap rent; established thirty years; wants to sell on account of sickness; will sacrifice for $9,000, at least half cash. Address BOX 1, care THE METAL INDUSTRY.

FOR SALE—Continued

BOOK

Foundry foremen and managers wishing to know the secrets of metal mixing, also cost and loss system, send for the book "THE METAL MIXER," written by an expert. Price, $1.00. Address, A. DEVINE, 121 E. Patterson Avenue, Columbus, Ohio.

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WANTED—SECOND-HAND HYDRAULIC PRESS for making wire solder. Address BOX 105, care THE METAL INDUSTRY.

WANTED—A 10 h. p. UPRIGHT BOILER. Must be in good condition and at low cost. Address S-1, care THE METAL INDUSTRY.

WANTED—Second-hand 6 or 8 h. p. horizontal engine and boiler. State what make, condition and price. Address HORIZONTAL, care THE METAL INDUSTRY.

WANTED—A copy of THE METAL INDUSTRY for February, 1905. Address FEBRUARY, care THE METAL INDUSTRY.

BUSINESS OPPORTUNITIES

RUST PROOF BLACK FORMULA. ¶ For full particulars address ¶ Wm. Schneider, ¶ Care of THE METAL INDUSTRY, ¶ 99 John Street, New York.

Concern doing a large business in bronze marine goods desires to acquire patents or manufacturing rights to a suitable article which can be marketed during the fall and winter. Equipment comprises well-equipped brass foundry, machine shop and polishing room. Location near New York. Address C. B. F., care THE METAL INDUSTRY.

I HAVE UP-TO-DATE FACTORY BUILDINGS covering about 30,000 square feet of ground, railroad siding, modern economical power, electric lighting and steam heating plants, all situated on a portion of my four acres of ground which has CITY ADVANTAGES and COUNTY TAXES. The location is an Eastern seaport town. The factory is equipped with modern brass-finishing machinery, nickel-plating plant, etc. As I am about to establish a Plumbers' Brass Goods Manufactory, I desire a partner who understands the plumbers' brass goods manufacturing business in all its branches who can contribute $15,000 (more or less) in cash. Besides the above-mentioned factory buildings, land, machinery, etc., I shall invest $15,000 (more or less) in cash, thus giving the association $15,000 cash working capital. Non-union brass working labor, in all its branches, is plentiful in our city at wages about 15 per cent. less than in similar large cities in the United States. Applicant please reply with full particulars, stating past experience. Do not answer unless you mean business. All correspondence strictly confidential, and will be returned if desired. Address FACTORY, care THE METAL INDUSTRY.



TRADE WANTS



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INQUIRIES

Inquiries received by THE METAL INDUSTRY for Metals, Machinery and Supplies. Further particulars may be obtained by addressing the inquiry number, care THE METAL INDUSTRY. No charge for inserting these inquiries.

Inquiry No. 297.—We would like to get in touch with the best and largest manufacturers of a composition for polishing and buffing. Also the largest manufacturers of polishing and buffing wheels.

Inquiry No. 298.—We would like to correspond with jobbers and consumers of new nickel clippings. Also large consumers of quicksilver.

Inquiry No. 299.—We would like to correspond with the manufacturers of metal molds.

Inquiry No. 300.—We would like to correspond with the makers of nickel-plated and German silver brackets, corner brackets, movable shelf brackets.

Inquiry No. 301.—We would like to correspond with firms making a zinc retort furnace.

Inquiry No. 302.—We would like to procure millitinum wire or metal.

Inquiry No. 303.—We would like to correspond with firms who do silverware stamping. Also firms making dies for pressing German silver.

SITUATIONS OPEN

ROLLING MILL SUPERINTENDENT

WANTED—MANAGING SUPERINTENDENT to take charge of a ROLLING MILL manufacturing COPPER AND BRASS SHEETS, TUBES and RODS. This job offers a splendid opportunity for a competent man. For particulars, apply J. F. FROWN, 185 Yonge street, Toronto, Ont., Canada.

SALESMAN

WANTED—EXPERIENCED COPPER and BRASS SALESMAN in Philadelphia and surrounding territory, give full particulars first letter. Address COPPER SALESMAN, care THE METAL INDUSTRY.

WANTED—An experienced SALESMAN with an established trade to sell several well-known grades of BABBITT METALS; territory unlimited. Address M-7, care THE METAL INDUSTRY.

FOUNDERS

WANTED—FOUNDRY FOREMAN for small foundry in large manufacturing plant located in western New York. We are looking for an expert versed in up-to-date methods, able to produce brass, bronze and aluminum castings of the highest quality and to locate defects and find the proper remedy. State age, nationality, salary expected, whether single or married and give references. Address BOX 104, care THE METAL INDUSTRY.

WANTED—YELLOW BRASS FOUNDRY FOREMAN by up-todate concern making Plumbers' Brass Goods. Good executive, able to get out orders, handle help and produce first-class Yellow Brass Castings. One now employed preferred. Reply treated confidentially. Location Philadelphia. Address YELLOW BRASS, care THE METAL INDUSTRY.

WANTED—Two Non-Union experienced FLOOR MOLDERS in AUTOMOBILE ALUMINUM WORK. Steady work and good wages. Address, FLOOR MOLDERS, care THE METAL INDUSTRY.

WANTED—A first-class BRASS FOUNDRY FOREMAN to take charge of a new MODERN BRASS FOUNDRY making a full line of Steam and Water Goods. Foundry equipped with Sand Handling Machinery, Molding Machines and Schwartz Melting Furnaces. Factory located in Western Pennsylvania. State age and experience. Address MODERN BRASS, care THE METAL INDUSTRY.

CORE MAKERS

WANTED—Four Non-Union Core Makers, experienced in AUTOMOBILE ALUMINUM WORK. Steady work and good wages. Address, CORE MAKERS, care THE METAL INDUSTRY.

DIE CASTER

WANTED—A MANAGING SUPERINTENDENT capable of taking complete charge of a DIE CASTING PLANT in CANADA, preferably one who can become interested financially and act as director. Address CANADA MANAGER, care THE METAL INDUSTRY.

MODELLER AND PATTERN MAKER

WANTED—MODELLER AND PATTERN MAKER for CHANDELIER FACTORY. Give experience and salary required. Address BOX 103, care THE METAL INDUSTRY.

SITUATIONS OPEN—Continued

MOLD MAKER

WANTED—Competent man to design and make METAL MOLDS, such as are used in the manufacture of casket hardware. State age, experience and salary expected. Address METAL MOLDS, care THE METAL INDUSTRY.

MACHINIST

WANTED—A good man to take charge of our MACHINE ROOM. One that can handle help and who is practical in the PLUMBERS' SUPPLY line (the manufacturing of plumbers' supplies). For full particulars, address PLUMBERS' SUPPLY, care THE METAL INDUSTRY.

SHEET METAL WORKER

WANTED—FOREMAN for SHEET METAL DEPARTMENT. Well established automobile concern; for making fenders, tanks, radiators, etc. Excellent opportunity for first-class man. Address D-2, care THE METAL INDUSTRY.

ELECTRO GALVANIZER

WANTED—ELECTRO GALVANIZER—An absolutely reliable, experienced and steady man to act as foreman and work on tanks; one not afraid of work. Wages must be moderate to start, but unusual prospects and permanent position to the right man. In answering give full particulars as to experience, wages wanted, etc. Address ELECTRO-GALVANIZER, care THE METAL INDUSTRY.

GALVANIZER

WANTED—Experienced FOREMAN for GALVANIZING SHOP doing job work. Must be sober and industrious. State experience and wages expected. Address WITT CORNICE CO., Cincinnati, Ohio.

SITUATIONS WANTED

Advertisements Under This Heading 50 Cents Each Insertion.

EXECUTIVE

SITUATION WANTED—As EXECUTIVE, ORGANIZER, COSTS and BUYING EXPERT. Several years with one of the largest hardware manufacturers in the world. Educated at Yale University, 31 years old. Has personal acquaintance with a large proportion of the Eastern trade, particularly along practical lines. For full particulars address F-9, care THE METAL INDUSTRY.

SITUATION WANTED—As SUPERINTENDENT or GENERAL FOREMAN in a brass manufacturing establishment. Automobile, steam, and the general line of brass goods. Able to obtain results. Twenty years' experience. Address GENERAL FOREMAN, care THE METAL INDUSTRY.

SITUATION WANTED—As MANAGER or SUPERINTENDENT. Energetic, aggressive, experienced in manufacture of PLUMBERS' BRASS work, valves, etc. Can handle help and get the work out. Modern methods, interchangeable parts, technical education. Address S-6, care THE METAL INDUSTRY.

SITUATION WANTED—BRASS FOUNDRY SUPERINTENDENT or FOREMAN. Thoroughly experienced on ALUMINUM CASTINGS for automobiles, valve, pump and general jobbing lines. Thirty-two years old, temperate and a hustler. Well up on molding machines and mixing metals. Address 0-2, care THE METAL INDUSTRY.

SITUATION WANTED—Position as MANAGER or SUPERINTENDENT with concern manufacturing BRASS GOODS. Technical graduate, married, sober, industrious and energetic, 30 years old, experienced on PLUMBERS' BRASS GOODS, BUILDERS' HARDWARE, etc.; INTERCHANGEABLE PARTS, modern methods, executive, cost accountant. References. Address R., care THE METAL INDUSTRY.

PROFESSIONAL

SITUATION WANTED—By technical trained METALLURGIST, graduate of Eastern university; several years' practice in large galvanizing works. Would like to engage with galvanizing or sherardizing firm. Best of references. Address UNIVERSITY, care THE METAL INDUSTRY.

SITUATION WANTED—By a practical STEAM and ELECTRICAL ENGINEER, 2nd class N. Y. license; wishes steady employment. Holding a responsible position for the last 8 years with a large modern electrical plant. Good reference; capable of taking charge. Address T. S., care THE METAL INDUSTRY.

SITUATION WANTED—By METALLURGIST who has had 12 years' experience as CHEMIST, METALLURGIST and ASSISTANT SUPERINTENDENT. Desire change of work and advancement. Address C, care THE METAL INDUSTRY.



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SITUATIONS WANTED—Continued

PROFESSIONAL—Continued

SITUATION WANTED—As CHEMIST. A technical graduate with five years' practical experience in metallurgical laboratories. Can furnish references upon request. Address N-4, care THE METAL INDUSTRY.

SALESMAN

SITUATION WANTED—AS SALESMAN in New York or western territory with manufacturer of brass and copper goods, sheet, rod, wire and tubing. Have had 8 years' experience and wide acquaintance with trade. Address BOX 106, care THE METAL INDUSTRY.

SITUATION WANTED—SALESMAN to represent manufacturer in Chicago and Middle West. Especially successful in selling specialties. Have well equipped office, acquaintanceship among hardware, stationery and department store buyers. Can furnish references. Address SAVAGE, 56 Fifth avenue, Chicago, Ill.

PATTERN MAKER

SITUATION WANTED—By a MODELLER and PATTERN MAKER in the Brass trade. Have had 25 years' experience in gas, electric, water and steam fittings, cabinet, brass foundry and bedstead manufacture. For four successive years have held a position as teacher in classes arranged for BRASS WORKERS in all departments, for practical and theoretical instruction. For full particulars of my ability, etc., address F-10, care THE METAL INDUSTRY.

SITUATION WANTED—FOREMAN METAL PATTERN MAKER experienced on steam specialties and plumbers' brass goods, also the manufacture of general brass goods. Address B, care THE METAL INDUSTRY.

FOUNDERS

SITUATION WANTED—By a BRASS FOUNDER with five years' experience. Thoroughly familiar with all compositions used in up-to-date foundries and have run nine furnaces. Address N-9, care THE METAL INDUSTRY.

SITUATION WANTED—BRASS FOUNDRY FOREMAN desires a position in a foundry just starting. Can give best results in machine moldings and furnaces. Can look after the making up of patterns to see that they give good results in molding and finishing. Can mix metals for any work desired, enabling you to meet all competitors. Address, M. B., care THE METAL INDUSTRY.

SITUATION WANTED—By FURNACE TENDER. Has had 9 years' experience and can furnish references. Address A-3, care THE METAL INDUSTRY.

SITUATION WANTED—FOUNDRY FOREMAN. First-class valve foundry foreman, up to date on everything in the valve line. Address Z. Y. X., care THE METAL INDUSTRY.

SITUATION WANTED—By a PLASTER COMPOSITION FOUNDRYMAN with 9 years' experience at fine arts castings in metals, plaster, wax and glue; also for patterns for engraving machines. Address P. C. F., care THE METAL INDUSTRY.

SITUATION WANTED—FRENCH SAND MOLDER wishes a position in foundry. Experienced on ornamental and architectural bronze, statuary, gold and silver castings. Estimates given on all kinds of work. Address FRENCH SAND MOLDER, care THE METAL INDUSTRY.

GERMAN SILVER CASTER

SITUATION WANTED—By GERMAN SILVER and BRASS INGOT CASTER. Have had 16 years' experience in high-grade German Silver and Brass. Can make my own German silver and silver solders. Address CASTER, care THE METAL INDUSTRY.

SHEET METAL WORKER

SITUATION WANTED—By SHEET METAL WORKER. German, 16 years experience in making brass and copper ware, bar linings, chandelier work, auto radiators and lamps, fenders, etc., and all details in sheet metal. Knows lay out of patterns. Educated man. Will accept position in any city. Address BOX 102, care THE METAL INDUSTRY.

SITUATION WANTED—By FOREMAN SHEET METAL WORKER. Good all round man on brazing, silver soldering, hammering. Does own turning. Address F-1, care THE METAL INDUSTRY.

CHASER

SITUATION WANTED—By CHASER for ornamental and statuary work; 4 years' experience at Paris. Address F. C., care THE METAL INDUSTRY.

ETCHER

SITUATION WANTED—Thoroughly practical transfer etcher on silver, brass, copper and organic substances, desires to make a change. Good recommendations. Address X. T., care THE METAL INDUSTRY.

SITUATIONS WANTED—Continued

PLATERS AND POLISHERS

ELECTROPLATERS

Any one desiring the services of first class men for the electrodeposition of metals and finishing in all branches and departments of the plating business can secure such services by corresponding with the Secretary of the National Electro-Platers' Association, George B. Hogaboom, 656 Hunterdon Street, Newark, N. J.

WANTED—To correspond with a MR. ZEIDMAN who we understand is employed in a polishing or plating plant in New York City or vicinity. Address BOX 107, care THE METAL INDUSTRY.

SITUATION WANTED—By a PLATER, 35 years of age, with five years' experience on CHANDELIER work and six years in a JOBBING SHOP. Position in Philadelphia, New York or vicinity preferred. Address BOX 100, care THE METAL INDUSTRY.

SITUATION WANTED.—A POLISHER and PLATER wishes to change; can take full charge of the finishing end. No place too large. Total abstainer. Good references. Address F. J. H., care THE METAL INDUSTRY.

SITUATION WANTED—Expert up-to-date NOVELTY ELECTROPLATER who has run the largest jewelry plant in the East. Address BOX 101, care THE METAL INDUSTRY.

SITUATION WANTED—EXPERT PLATER and POLISHER as FOREMAN with a reliable firm. Can handle help to very good advantage. Up-to-date on all finishes in a very economical manner. Would begin at a moderate salary. Age 38, married. Can furnish the best of reference. Address, N. LEVY, 227 Hampshire street, Cambridge, Mass.

SITUATION WANTED—PLATER, expert on all finishes in GOLD, SILVER, NICKEL, COPPER, BRASS OXIDIZING, BRONZING, etc. on fancy metal goods. Can do work in the cheapest way. Also expert on solid gold and silver. Understands the making of all solutions. Can install plating department, if necessary, and take charge. Have had 10 years' experience. Can furnish references to any firm offering a steady position. If references are required give full details of position in first letter. Address, PLATER, care Weiner, 398 Grand street, New York City.

SITUATION WANTED—By an ELECTRO-PLATER, 18 years' experience with Nickel, Copper, Brass and Bronze solutions and oxidizing. Can furnish good reference. Address BOX M-9, care THE METAL INDUSTRY.

SITUATION WANTED—By a FOREMAN-PLATER who thoroughly understands the plating business from A to Z. Has had several years' experience and is capable of taking charge. Address P. H., care THE METAL INDUSTRY.

SITUATION WANTED—By a PLATER. First-class man on SILVER, BRASS, COPPER, BLACK NICKEL, BRONZE, all oxidizing, etc. Has had a wide experience in lines stated above. Steady and sober. Address J. O., care THE METAL INDUSTRY.

SITUATION WANTED—By ELECTRO-PLATER with over 20 years' experience. Thoroughly understands all branches of plating, dipping, bronzing, etc. Address A-2, care THE METAL INDUSTRY.

SITUATION WANTED—By a PLATER having had ten years' experience on all metals and finishes. Can furnish best of reference. Address CONNECTICUT, care THE METAL INDUSTRY.

SITUATION WANTED—Position as ELECTRO-GILDER and PLATER. Expert worker in jobbing, gilding and plating. Address JOB GILDER, care THE METAL INDUSTRY.

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Chucks, Spinning
Bliss, E. W., Co., Brooklyn, N. Y.
Pryibil, P., New York.
Schulz, Fritz A., Chicago, Ill.

Cock Grinder, Automatic
Turner Machine Co., Philadelphia, Pa.

Composition Metal Ingots and Castings.
Ajax Metal Co., Philadelphia, Pa.
Allan, A., & Son, New York.
American Manganese Bronze Co., New York.
Buermann, August, Newark, N. J.
Eastern Metal & Refining Co., Boston, Mass.
Hoyt Metal Co., New York.
North American Smelting Co., Philadelphia, Pa.
Reeves, Paul S., & Son, Philadelphia, Pa.
Riverside Metal Co., Riverside, N. J.
White & Bro., Inc., Philadelphia, Pa.

Composition Metal Tacks, Nails, Etc.
Hussey, C. G., & Co., Pittsburg, Pa.

Conveyors.
Nicholls, Wm. H., New York.
Pangborn, Thomas W., Company, New York.

Copper, Carbonate of
Detroit Foundry Supply Co., Detroit, Mich.

Copper Castings.
American Manganese Bronze Co., New York.
Reeves, Paul S., & Son, Philadelphia, Pa.

Copper Ingots.
American Metal Co., New York.
American Smelting & Refining Co., Cincinnati, O.
Birkenstein, S., & Sons, Chicago, Ill.
Fitz, Dana & Co., Boston, Mass.
Hendricks Brothers, New York.
Leavitt, C. W., & Co., New York.
Merchant & Evans Co., Philadelphia, Pa.
North American Smelting Co., Philadelphia, Pa.
Richards & Co., Boston, Mass.
Riverside Metal Co., Riverside, N. J.
Standard Rolling Mills Inc., Brooklyn, N. Y.
Taunton-New B'fd Copper Co., New Bedford, Mass.
Vogelstein, L., & Co., New York.
White & Bro., Inc., Philadelphia, Pa.

Copper Nails and Tacks.
Hassall, John, Inc., New York.
Hussey, C. G., & Co., Pittsburg, Pa.
Scovill Manufacturing Co., Waterbury, Conn.
Taunton-New B'fd Copper Co., New Bedford, Mass.

Copper Rivets.
Hassall, John, Inc., New York.
Hendricks Bros., New York.

Copper Sheets, Wire, Rods, Bolts, Etc. (See Brass and Copper Sheets, etc.).

Copper, Shot
Seymour Manufacturing Co., Seymour, Conn.

Copper, Sulphate of
Grasselli Chemical Co., Cleveland, O.

Copper Tubes (See Brass and Copper Tubes)

Core Compound (See also Foundry Supplies).
Detroit Foundry Supply Co., Detroit, Mich.
Paxson, J. W., Co., Philadelphia, Pa.

Core Machines (See also Foundry Supplies).
Brown Specialty M'ch'y Co., Chicago, Ill.
Detroit Foundry Supply Co., Detroit, Mich.
Nicholls, W. H., New York.
Pangborn, Thomas W., Company, New York.

Core Ovens (See also Foundry Supplies).
Detroit Foundry Supply Co., Detroit, Mich.
Gehnrich, Hermann, New York.
Monarch Eng. & Mfg. Co., Baltimore, Md.
Nicholls, Wm. H., New York.
Pangborn, Thomas W., Company, New York.
Paxson, J. W., Co., Philadelphia, Pa.
Rockwell Furnace Co., New York.
Smith, J. D., Foundry & Supply Co., Cleveland, O.
Stevens, Frederic B., Detroit, Mich.

Core Tapering Machines (See also Foundry Supplies).
Brown Specialty M'ch'y Co., Chicago, Ill.
Detroit Foundry Supply Co., Detroit, Mich.
Nicholls, Wm. H., New York.
Pangborn, Thomas W., Company, New York.

Core Vents and Supports, Metal
Niagara Device Co., Buffalo, N. Y.

Cranes.
Detroit Foundry Supply Co., Detroit, Mich.

Crucibles, Platinum
Bishop, J., & Co., Malvern, Pa.

Crucibles, Stirrers, Stoppers, Nozzles, Etc. (See also Foundry Supplies).
Bartley, Jonathan, Crucible Co., Trenton, N. J.
Dixon, Jos., Crucible Co., Jersey City, N. J.
Gautier, J. H. & Co., Jersey City, N. J.
McCullough-Dalzell Crucible Co., Pittsburg, Pa.
Paige Retort & Crucible Co., Taunton, Mass.
Ross-Tacony Crucible Co., Philadelphia, Pa.
Taylor, R. J., Inc., Philadelphia, Pa.

Crushers, Cinder (See also Foundry Supplies).
Detroit Foundry Supply Co., Detroit, Mich.
Farrel Foundry & Machine Co., Ansonia, Conn.
Moussette, O. J., Co., Brooklyn, N. Y.
Nicholls, Wm. H., New York.
Osborn Mfg. Co., Cleveland, O.
Paxson, J. W., Co., Philadelphia, Pa.
Waterbury (Conn.) Farrel Foundry & Machine Co.

Cupror Metal.
Cupror Co., The, New York.

Cyanide of Potassium (See also Platers' Supplies).
McKesson & Robbins, New York.

Die-Castings.
Finished Parts Mfg. Co., Newark, N. J.

Dies, Sheet Metal Working
Baird Machine Co., Oakville, Conn.
Bliss, E. W., Co., Brooklyn, N. Y.
Blue Ridge Metal Mfg. Co., Susquehanna, Pa.
Globe Machine Stamping Co., Cleveland, O.
Waterbury (Conn.) Farrel Foundry & Machine Co.

Draw Benches—Wire, Rod and Tube
Farrel Foundry & Machine Co., Ansonia, Conn.
Oliver, W. W. Mfg. Co., Buffalo, N. Y.
Torrington Mfg. Co., Torrington, Mass.
Waterbury (Conn.) Farrel Foundry & Machine Co.

Drying-Out Machines.
Baird Machine Co., Oakville, Conn.
Smith & Richardson, Attleboro, Mass.
Torrington Mfg. Co., Torrington, Mass.
Waterbury (Conn.) Farrel Foundry & Machine Co.

Drosses (See Metal Turnings, Drosses, etc.).

Dust Collectorsand Ventilating Systems.
Cleveland Blow Pipe & Mfg. Co., Cleveland, O.
Kirk & Blum, Cincinnati, O.
Knickerbocker Co., The, Jackson, Mich.
Leiman Bros., New York.
Pangborn, Thomas W., Company, New York.

Dynamos, Platers' and Galvanizers' (See also Platers' Supplies).
Backus & Lesser Co., New York.
Benjamin's, Inc., Philadelphia, Pa.
Bennett-O'Connell Co., Chicago, Ill.
Bogue, Chas. J., Electric Co., New York.
Connecticut Dynamo & Motor Co., Irvington, N. J.
Hanson & Van Winkle Co., Newark, N. J.
L'Hommedieu, C. L. & Sons, Chicago, Ill.
Oliver, W. W., Mfg. Co., Buffalo, N. Y.
U. S. Electro Galvanizing Co., Brooklyn, N. Y.

Electric Cleaning Compounds (See Metal Cleaning Compounds).

Electroplating, Polishing, Coloring, Etc.
American Toy & Novelty Co., Chicago, Ill.
Blue Ridge Metal Mfg. Co., Susquehanna, Pa.
Buermann, August, Newark, N. J.
Northern Ohio Mfg. & Refg. Works, Cleveland, O.
Sargeant Mfg. Co., Newark, N. J.

Emery. (See Platers' Supplies).

Emery Wheels
Carborundum Co., Niagara Falls, N. Y.

Enameling Ovens.
Gehnrich, Herrmann, New York.
Rockwell Furnace Co., New York.
Steiner, E. E., Newark, N. J.

Engineers, Mechanical, Foundry, Etc.
Pangborn, Thomas W., Company, New York.
Smith, J. D., Foundry Supply Co., Cleveland, O.
Thompson, Hugh L., Waterbury, Conn.

Escutcheon Pins, All Metals
Hassall, John, New York.

Etched Name Plates.
Schweizer, Max, Bridgeport, Conn.

Exhaust Fans.
Cleveland Blow Pipe & Mfg. Co., Cleveland, O.
Leiman Bros., New York.
Pangborn, Thomas W., Company, New York.

Expert Instruction—Plating, Coloring, Dipping, Etching, Etc.
Proctor & Stremel, Arlington, N. J.
Schweizer, Max, Bridgeport, Conn.

Felt Manufacturers.
Bacon Felt Co., Winchester, Mass.

Fire Brick (See also Foundry Supplies).
Detroit Foundry Supply Co., Detroit, Mich.
Stevens, Frederic B., Detroit, Mich.

Flasks, Brass Molders' (See also Foundry Supplies).
McPhee, Hugh, Tarrytown, N. Y.
Middleditch, Benj., Detroit, Mich.
Nicholls, W. H., New York.
Osborn Mfg. Co., Cleveland, O.
Sterling Wheelbarrow Co., West Allis, Wis.

Fluxes, Metal (See also Foundry Supplies).
Bassite Smelting & Mfg. Co., Cincinnati, O.
Buckeye Products Co., Cincinnati, O.
Reeves, Paul S., & Son, Philadelphia, Pa.

Fluxes, Soldering and Tinning
Grasselli Chemical Co., Cleveland, O.
Reeves, Paul S., & Son, Philadelphia, Pa.
Richards & Co., Boston, Mass.
Spice, The Alfred, Process, Philadelphia, Pa.

Forgings, Automobile
American Manganese Bronze Co., New York.
Bliss, E. W., Co., Brooklyn, N. Y.

Foundry Facings (See also Foundry Supplies).
Buckeye Products Co., Cincinnati, O.
Detroit Foundry Supply Co., Detroit, Mich.
Dixon, Jos., Crucible Co., Jersey City, N. J.
McKesson & Robbins, New York.
Paxson, J. W., Co., Philadelphia, Pa.
Stevens, Frederic B., Detroit, Mich.

Foundry Supplies and Equipment.
Birkenstein S., & Sons, Chicago, Ill.
Brown Specialty Machinery Co., Chicago, Ill.
Buckeye Products Co., Cincinnati, O.
Carborundum Co., Niagara Falls, N. Y.
Detroit Foundry Supply Co., Detroit, Mich.
Fisher, Alfred, Chicago, Ill.
Hawley Down Draft Furnace Co., Chicago, Ill.
Kroschell Bros. Co., Chicago, Ill.
McPhee, Hugh, Tarrytown, N. Y.
Middleditch, Benj., Detroit, Mich.
Monarch Eng. & Mfg. Co., Baltimore, Md.
Niagara Device Co., Buffalo, N. Y.
Nicholls, Wm. H., New York.
Obermayer Co., The S., Cincinnati, O.
Osborn Mfg. Co., Cleveland, O.
Pangborn, Thomas W., Company, New York.
Paxson, J. W., Co., Philadelphia, Pa.
Smith, J. D., Foundry Supply Co., Cleveland, O.
Sterling Wheelbarrow Co., West Allis, Wis.
Stevens, Frederic B., Detroit, Mich.

Furnace Linings (See also Foundry Supplies).
Detroit Foundry Supply Co., Detroit, Mich.
Paxson, J. W., Co., Philadelphia, Pa.
Rockwell Furnace Co., New York.
Stevens, Frederic B., Detroit, Mich.

Furnaces, Annealing, Brazing, Etc.
Bates & Peard Annealing Furnace Co., New York.
Detroit Foundry Supply Co., Detroit, Mich.
Fisher, Alfred, Chicago, Ill.
Leiman Bros., New York.
Monarch Eng. & Mfg. Co., Baltimore, Md.
Rockwell Furnace Co., New York.
Rockwell, W. S., Co., New York.
Waterbury (Conn.) Farrel Foundry & Machine Co.

Furnaces, Electric
Bristol Co., The Waterbury, Conn.

Furnaces, Galvanizing and Tinning
Farrel Foundry & Machine Co., Ansonia, Conn.
Monarch Eng. & Mfg. Co., Baltimore, Md.
Rockwell Furnace Co., New York.
Rockwell, W. S., Co., New York.

Furnaces, Melting, for Oil, Coal, Coke, or Gas (See also Foundry Supplies).
Chicago Flexible Shaft Co., Chicago, Ill.
Detroit Foundry Supply Co., Detroit, Mich.
Fisher, Alfred, Chicago, Ill.
Hawley Down Draft Furnace Co., Chicago, Ill.
Ideal Furnace Co., Chester, Pa.
Kroschell Bros. Co., Chicago, Ill.
Leiman Bros., New York.
Monarch Eng. & Mfg. Co., Baltimore, Md.
Paxson, J. W., Co., Philadelphia, Pa.
Rockwell Furnace Co., New York.
Rockwell, W. S., Co., New York.
Wise, J. B., Watertown, N. Y.

Furnaces, Reverberatory
Rockwell Furnace Co., New York.
Rockwell, W. S., Co., New York.

Fusel Oil, Refined (See also Platers' Supplies).
McKesson & Robbins, New York.
Nikolas, G. J., & Co., Chicago, Ill.

Galvanized Specialties, Nails, Screws, Etc.
U. S. Electro Galvanizing Co., Brooklyn, N. Y.

Galvanizers' Equipment (See also Platers' and Polishers' Supplies).
Globe Machine & Stamping Co., Cleveland, O.
Hanson & Van Winkle Co., Newark, N. J.
Meaker Co., Chicago, Ill.
U. S. Electro Galvanizing Co., Brooklyn, N. Y.

Galvanizing Barrels and Automatic Devices.
U. S. Electro Galvanizing Co., Brooklyn, N. Y.
Globe Machine & Stamping Co., Cleveland, O.

Galvanizing for the Trade.
U. S. Electro Galvanizing Co., Brooklyn, N. Y.

Galvanizing Plants.
Globe Machine & Stamping Co., Cleveland, O.
Hanson & Van Winkle Co., Newark, N. J.
Meaker Co., Chicago, Ill.
U. S. Electro Galvanizing Co., Brooklyn, N. Y.

German Silver Ingots, Castings, Etc.
Buermann, August, Newark, N. J.
Reeves, Paul S., & Son, Philadelphia, Pa.
Riverside Metal Co., Riverside, N. J.
Seymour Manufacturing Co., The, Seymour, Conn.

German Silver Sheets, Wire, Rods, Tubes, Etc.
Pilling Bros. Co., Waterbury, Conn.
Reeves, Paul S., & Son, Philadelphia, Pa.
Riverside Metal Co., Riverside, N. J.
Scovill Manufacturing Co., Waterbury, Conn.
Seymour Manufacturing Co., The, Seymour, Conn.
Waterbury Brass Co., Waterbury, Conn.

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Gold Alloys.
Riverside Metal Co., Riverside, N. J.

Gold Ingots, Bars, Plates, Etc.
Renziehausen, Wm. F., Co., Newark, N. J.
Riverside Metal Co., Riverside, N. J.

Graphite (See Foundry Supplies).

Grinding Machinery.
Bennett-O'Connell Co., Chicago, Ill.
Blake & Johnson Co., Waterbury, Conn.
Carborundum Co., Niagara Falls, N. Y.
Connecticut Dynamo & Motor Co., Irvington, N. J.
Osborn Mfg. Co., Cleveland, O.
Schulz, Fritz A., Chicago, Ill.
Waterbury (Conn.) Farrel Foundry & Machine Co.

Grinding Wheels (See also Foundry Supplies).
Carborundum Co., Niagara Falls, N. Y.

Heat Gages.
Bristol Co., Waterbury, Conn.
Brown Instrument Co., Philadelphia, Pa.

Hoists, Electric, Pneumatic, Hand
Detroit Foundry Supply Co., Detroit, Mich.

Hydraulic Machinery, Jacks, Etc.
Farrel Foundry & Machine Co., Ansonia, Conn.
Waterbury (Conn.) Farrel Foundry & Machine Co.
Watson-Stillman Co., New York.

Iron, Scrap, Dealers in
Smith, The Morton B., New York.

Iron Tubes, Brass and Bronze Covered
Phoenix Tube Co., Brooklyn, N. Y.

Japanning Ovens.
Gehnrich, Hermann, New York.
Rockwell Furnace Co., New York.
Steiner, E. E., Newark, N. J.

Jewelers' Equipment and Supplies (See also Plater's Supplies).
Leiman Bros., New York.
Oliver, W. W., Mfg. Co., Buffalo, N. Y.

Jewelers' Findings.
Smith & Richardson, Attleboro, Mass.

Kettles, Galvanizing and Tinning (See also Platers' Supplies).
Farrel Foundry & Machine Co., Ansonia, Conn.

Lacquer Enamels (See also Platers' Supplies).
Celluloid Zapon Co., New York.
Egyptian Lacquer Mfg. Co., New York.
Eureka Pneumatic Spray Co., New York.

Lacquering Ovens.
Gehnrich, Hermann, New York.
Steiner, E. E., Newark, N. J.

Lacquer Sprayers.
Eclipse Air Brush & Compressor Co., Bloomfield, N. J.
Eureka Pneumatic Spray Co., New York.
Paasche Air Brush Co., Chicago, Ill.

Lacquers, Metal (See also Platers' Supplies).
American Lacquer Co., Bridgeport, Conn.
Celluloid Zapon Co., New York.
Egyptian Lacquer Manufacturing Co., New York.
Eureka Pneumatic Spray Co., New York.
General Bakelite Co., New York.
Hanson & Van Winkle Co., Newark, N. J.
Kalbfleisch, Franklin H., Co., New York.
New Era Lustre Co., New Haven, Conn.
Nikolas, G. J., & Co., Chicago, Ill.

Ladle Heaters and Dryers (See also Foundry Supplies).
Detroit Foundry Supply Co., Detroit, Mich.
Hawley Down Draft Furnace Co., Chicago, Ill.
Monarch Eng. & Mfg. Co., Baltimore, Md.
Pangborn, Thomas W., Co., Baltimore, Md.
Paxson, J. W., Co., Philadelphia, Pa.
Rockwell Furnace Co., New York.

Ladles (See also Foundry Supplies).
Detroit Foundry Supply Co., Detroit, Mich.

Lathes, Polishing (See Platers' and Polishers' Supplies).

Lathes, Spinning, Turning, Etc.
American Tool & Machine Co., Boston, Mass.
Bliss, E. W., Co., Brooklyn, N. Y.
Oliver, W. W., Mfg. Co., Buffalo, N. Y.
Pryibil, P., New York.
Schulz, Fritz A., Chicago, Ill.
Waterbury (Conn.) Farrel Foundry & Machine Co.

Lathes, Turret
American Tool & Machine Co., Boston, Mass.

Lead, Antimonial
Hoyt Metal Co., New York.
Leavitt, C. W., & Co., New York.
Richards & Co., Boston, Mass.
Standard Rolling Mills Inc., Brooklyn, N. Y.

Lead Castings, Antimonial
Hoyt Metal Co., New York.
Standard Rolling Mills Inc., Brooklyn, N. Y.

Lead, Pig and Bar
American Smelting & Refining Co., Cincinnati, O.
Birkenstein, S., & Sons, Chicago, Ill.
Fitz, Dana & Co., Boston, Mass.
Hendricks Bros., New York.
Illinois Smelting & Refining Co., Chicago, Ill.
Merchant & Evans Co., Philadelphia, Pa.
National Metal Reduction Co., Cleveland, O.
Richards & Co., Boston, Mass.
Standard Rolling Mills Inc., Brooklyn, N. Y.
U. S. Reduction Co., Chicago, Ill.
Vogelstein, L., & Co., New York.

Lead Pipe.
North American Smelting Co., Philadelphia, Pa.

Lubricants.
Dixon, Joseph, Crucible Co., Jersey City, N. J.

Lycopodium. (See also Foundry Supplies).
McKesson & Robbins, New York.

Mahogany Pattern Lumber.
Thompson & Co., Lewis, Philadelphia, Pa.

Manganese Bronze Ingots and Castings.
Ajax Metal Co., Philadelphia, Pa.
Allan, A., & Son, New York.
American Manganese Bronze Co., New York.
Clum & Atkinson, Rochester, N. Y.
Electric Smelting & Alum. Co., Lockport, N. Y.
Fitz, Dana & Co., Boston, Mass.
North American Smelting Co., Philadelphia, Pa.
Reeves, Paul S., & Son, Philadelphia, Pa.
Richards & Co., Boston, Mass.
Riverside Metal Co., Riverside, N. J.
Taunton-New B'fd Copper Co., New Bedford, Mass.

Manganese Bronze Sheets, Rods, Etc.
American Manganese Bronze Co., New York.
Taunton-New B'fd Copper Co., New Bedford, Mass.

Manganese Copper.
American Metal Co., New York.
American Smelting & Refining Co., Cincinnati, O.
Electric Smelting & Alum. Co., Lockport, N. Y.
Reeves, Paul S., & Son, Philadelphia, Pa.
Riverside Metal Co., Riverside, N. J.
Roessler & Hasslacher Chemical Co., New York.

Manganese Metal.
Leavitt, C. W., & Co., New York.
Reeves, Paul S., & Son, Philadelphia, Pa.
Roessler & Hasslacher Chemical Co., New York.

Manganese Silicon.
Leavitt, C. W., & Co., New York.
McKesson & Robbins, New York.

Magnesium Aluminum.
Leavitt, C. W., & Co., New York.

Magnesium Metal.
Leavitt, C. W., & Co., New York.
McKesson & Robbins, New York.
Roessler & Hasslacher Chemical Co., New York.

Magnetic Metal Separators (See also Foundry Supplies).
American Concentrator Co., Joplin, Mo.
Capitol Brass Works, Detroit, Mich.
Dings Electro-Mag. Separator Co., Milwaukee, Wis.
Pangborn, Thomas W., Company, New York.

Match Plates.
McPhee, Hugh, Tarrytown, N. Y.
Middleditch, Benj., Detroit, Mich.

Metals (See name of metal wanted).

Metal Cleaning Compounds (See also Platers' Supplies).
Anthony, H. M., & Co., New York.
Cleveland Platers' Supply Co., Cleveland, O.
Electric Smelt. & Aluminum Co., Lockport, N. Y.
Hanson & Van Winkle Co., Newark, N. J.
International Chemical Co., Camden, N. J.
Stevens, Frederic B., Detroit, Mich.
Swan & Finch Co., New York.

Meta Core Vents and Supports
Niagara Device Co., Buffalo, N. Y.

Metal Fluxes (See also Foundry Supplies).
Bassite Smelting & Mfg. Co., Cincinnati, O.
Buckeye Products Co., Cincinnati, O.
Reeves, Paul S., & Son, Philadelphia, Pa.

Metallurgists, Consulting,
Detroit Testing Laboratory, Detroit, Mich.
Krom, L. J., New York.
Ledoux & Co., New York.

Metals, Dealers in all Kinds of New (See also name of metal wanted).
Andler, M. M., & Co., Boston, Mass.
Birkenstein, S., & Sons, Chicago, Ill.
Fitz, Dana & Co., Boston, Mass.
Merchant & Evans Co., Philadelphia, Pa.
Moers, Albert A., New York.
Richards & Co., Boston, Mass.

Metals, Dealers in Old
Andler, M. M., & Co., Boston, Mass.
Birkenstein, S., & Sons, Chicago, Ill.
Genesee Metal Co., Rochester, N. Y.
Illinois Smelting & Refining Co., Chicago, Ill.
Smith, The Morton B., Co., New York.
Riverside Metal Co., Riverside, N. J.

Metals, Dealers in Old—Gold, Silver, Platinum
Renziehausen, Wm. F., Co., Newark, N. J.
Riverside Metal Co., Riverside, N. J.

Metal Goods Made to Order.
Aluminum Goods Mfg. Co., Manitowoc, Wis.
American Toy & Novelty Co., Chicago, Ill.
Ansonia Brass & Copper Co., New York.
Blue Ridge Metal Mfg. Co., Susquehanna, Pa.
Bridgeport Brass Co., Bridgeport, Conn.
Buermann, August, Newark, N. J.
Manhattan Brass Co., New York.
Riverside Metal Co., Riverside, N. J.
Sargeant Mfg. Co., Newark, N. J.
Scovill Manufacturing Co., Waterbury, Conn.
Waterbury Brass Co., Waterbury, Conn.

Metal, Plated Sheet
Benson, H. K. & F. S., Glen Ridge, N. J.
National Sheet Metal Co., Peru, Ill.

Metal Refiners, Gold and Silver.
Genesee Metal Co., Rochester, N. Y.
Renziehausen, Wm. F., Co., Newark, N. J.
Riverside Metal Co., Riverside, N. J.

Metal Refiners—White Metal.
Birkenstein, S., & Sons, Chicago, Ill.
National Metal Reduction Co., Cleveland, O.
Reeves, Paul S., & Sons, Philadelphia, Pa.
Standard Rolling Mills Inc., Brooklyn, N. Y.
Toothill, John, Rochelle Park, N. J.

Metal, Silver Plated Sheet
Benson, H. K. & F. S., Glen Ridge, N. J.

Metal Spinning. (See also Metal Goods made to order).
Aluminum Goods Mfg. Co., Manitowoc, Wis.
Blue Ridge Metal Mfg. Co., Susquehanna, Pa.
Detroit Metal Spinning Co., Detroit, Mich.
Riverside Metal Co., Riverside, N. J.
Standard Rolling Mills Inc., Brooklyn, N. Y.

Metal Stamping. (See also Metal Goods made to order).
Aluminum Goods Mfg. Co., Manitowoc, Wis.
Blue Ridge Metal Mfg. Co., Susquehanna, Pa.
Detroit Metal Spinning Co., Detroit, Mich.
Globe Machine & Stamping Co., Cleveland, O.
Riverside Metal Co., Riverside, N. J.
Standard Rolling Mills Inc., Brooklyn, N. Y.

Metal Turnings, Drosses Residue, Etc., Buyers of
Andler, M. M., Co., Boston, Mass.
Birkenstein, S., & Sons, Chicago, Ill.
Illinois Smelting & Refining Co., Chicago, Ill.
Smith, The Morton B., Co., New York.
Toothill, John, Rochelle Park, N. J.
Whipple & Choate, Bridgeport, Conn.
White & Bro., Inc., Philadelphia, Pa.

Mold Dryers, Portable (See also Foundry Supplies).
Detroit Foundry Supply Co., Detroit, Mich.
Monarch Eng. & Mfg. Co., Baltimore, Md.
Pangborn, Thomas W., Company, New York.
Paxson, J. W., Co., Philadelphia, Pa.
Rockwell Furnace Co., New York.

Mold Spraying Machines. (See also Foundry Supplies).
Niagara Device Co., Buffalo, N. Y.
Pangborn, Thomas W., Company, New York.

Molds, Ingot (See also Foundry Supplies).
Farrel Foundry & Machine Co., Ansonia, Conn.
Leiman Bros., New York.
Nicholls, Wm. H., New York.
Paxson, J. W., Co., Philadelphia, Pa.
Waterbury (Conn.) Farrel Foundry & Machine Co.

Molding Machines. (See also Foundry Supplies).
Detroit Foundry Supply Co., Detroit, Mich.
McPhee, Hugh, Tarrytown, N. Y.
Nicholls, Wm. H., New York.
Osborn Mfg. Co., Cleveland, O.
Paxson, J. W., Co., Philadelphia, Pa.
Turner Machine Co., Philadelphia, Pa.

Monel Metal Sheets.
Merchant & Evans Co., Philadelphia, Pa.

Muntz's Metal—Sheets, Rods, Bolts, Nails, Etc.
Taunton-New B'fd Copper Co., New Bedford, Mass.

Nails. (See name of metal wanted).

Name Plates, Etched
Schweizer, Max, Bridgeport, Conn.

Nickel.
Hanson & Van Winkle Co., Newark, N. J.
Hendricks Bros., New York.
Leavitt, C. W., & Co., New York.
Merchant & Evans Co., Philadelphia, Pa.
Richards & Co., Boston, Mass.

Nickel Castings.
Hanson & Van Winkle Co., Newark, N. J.

Nickel Salts. (See also Platers' Supplies).
Detroit Foundry Supply Co., Detroit, Mich.
Hanson & Van Winkle Co., Newark, N. J.
McKesson & Robbins, New York.

Nickel, Shot
Merchant & Evans Co., Philadelphia, Pa.
Seymour Manufacturing Co., Seymour, Conn.

Nickel Silver Tubes.
Wells, A. H., & Co., Waterbury, Conn.

Oil Pumps and Storage Tanks.
Monarch Eng. & Mfg. Co., Baltimore, Md.
Rockwell Furnace Co., New York.

Oils, Tempering and Lubricating
McKesson & Robbins, New York.
Swan & Finch, New York.

Ovens. (See also Core, Lacquering, Enameling and Sherardizing Ovens).
Gehnrich, Hermann, New York.
Steiner, E. E., Newark, N. J.

Paint for Metals, Etc.
Woolsey, C. A., Co., Jersey City, N. J.

Parting Compounds. (See also Foundry Supplies).
Buckeye Products Co., Cincinnati, O.
Detroit Foundry Supply Co., Detroit, Mich.
Stevens, Frederic B., Detroit, Mich.

Pattern Lumber, Mahogany.
Thompson & Co., Lewis, Philadelphia, Pa.

Pattern Shop Supplies (See Foundry Supplies).

Patterns, Mounted
McPhee, Hugh, Tarrytown, N. Y.

Pewter.
Standard Rolling Mills Inc., Brooklyn, N. Y.

Phosphor Bronze Ingots, Castings, Etc.
Ajax Metal Co., Philadelphia, Pa.
Allan, A., & Son, New York.
Clum & Atkinson, Rochester, N. Y.
Fitz, Dana & Co., Boston, Mass.

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Seymour Mfg. Co., Seymour, Conn.

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Pilling Brass Co., Waterbury, Conn.
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Connecticut Dynamo & Motor Co., Irvington, N. J
Detroit Foundry Supply Co., Detroit, Mich.
Divine Bros. Co., Utica, N. Y.
General Bakelite Co., New York.
Globe Machine & Stamping Co., Cleveland, O.
Grasselli Chemical Co., Cleveland, O.
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International Chemical Co., Camden, N. J.
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Globe Machine & Stamping Co., Cleveland, O.
Hanson & Van Winkle Co., Newark, N. J.
L'Hommedieu, C. F., & Sons Co., Chicago, Ill.
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Rockhill & Vietor, New York.
Smith & Richardson, Attleboro, Mass.
U. S. Electro Galvanizing Co., Brooklyn, N. Y.

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Platinum Alloys, Salts, Solutions.
Bishop, J., & Co., Malvern, Pa.

Platinum Ingots.
Guiterman, Rosenfeld & Co., New York.

Platinum Laboratory Ware.
Bishop, J., & Co., Malvern, Pa.

Platinum Manufactured Goods.
Bishop, J., & Co., Malvern, Pa.

Platinum Refiners.
Bishop, J., & Co., Malvern, Pa.

Platinum Scrap, Buyers of
Bishop, J., & Co., Malvern, Pa.
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Bishop, J., & Co., Malvern, Pa.

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Abbott Ball Co., Hartford, Conn.
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Baird Machine Co., Oakville, Conn.
Bennett-O'Connell Co., Chicago, Ill.
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Cleveland Platers' Supply Co., Cleveland, O.
Connecticut Dynamo & Motor Co., Irvington, N. J.
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Divine Bros. Co., Utica, N. Y.
Globe Machine & Stamping Co., Cleveland, O.
Hanson & Van Winkle Co., Newark, N. J.
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Waterbury (Conn.) Farrel Foundry & Machine Co.

Presses, Cabbaging
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Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.

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Waterbury (Conn.) Farrel Foundry & Machine Co.

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Waterbury (Conn.) Farrel Foundry & Machine Co.

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Blake & Johnson Co., Waterbury, Conn.
Bliss, E. W., Co., Brooklyn, N. Y.
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Torrington Manufacturing Co., Torrington, Conn.
Waterbury (Conn.) Farrel Foundry & Machine Co.
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Leiman Bros., New York.
Monarch Eng. & Mfg. Co., Baltimore, Md.
Rockwell Furnace Co., New York.

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Brown Instrument Co., Philadelphia.

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Shuster, The F. B., Co., New Haven, Conn.

Rivets—Brass, Aluminum, Etc.
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Hendricks Bros., New York.
Kemp, W. H., Co., New York.

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Farrel Foundry & Machine Co., Ansonia, Conn.
Waterbury (Conn.) Farrel Foundry & Machine Co.

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Farrel Foundry & Machine Co., Ansonia, Conn.
Garrison, A., Fdy. & Machine Co., Pittsburg, Pa.
Torrington Manufacturing Co., Torrington, Conn.
Waterbury (Conn.) Farrel Foundry & Machine Co.

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Leiman Bros., New York.
Oliver, W. W., Mfg. Co., The, Buffalo, N. Y.
Waterbury (Conn.) Farrel Foundry & Machine Co.

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Blake & Johnson Co., Waterbury, Conn.
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Garrison, A., Fdy. & Machine Co., Pittsburg, Pa.
Oliver, W. W., Mfg. Co., The, Buffalo, N. Y.
Torrington Manufacturing Co., Torrington, Conn.
Waterbury (Conn.) Farrel Foundry & Machine Co.

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Paxson, J. W., Co., Philadelphia, Pa.

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Niagara Device Co., Buffalo, N. Y.
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Pangborn, Thomas W., Company, New York.
Paxson, J. W., Co., Philadelphia, Pa.

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Pangborn, Thomas W., Company, New York.

Sand Blast Tumbling Barrels.
Pangborn, Thomas W., Company, New York.

Sand Dryers
Pangborn, Thomas W., Company, New York.

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Pangborn, Thomas W., Company, New York.

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Pangborn, Thomas W., Company, New York.
Paxson, J. W., Co., Philadelphia, Pa.

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Detroit Foundry Supply Co., Detroit, Mich.
Pangborn, Thomas W., Company, New York.
Paxson, J. W., Co., Philadelphia, Pa.

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Detroit Foundry Supply Co., Detroit, Mich.
Osborn Mfg. Co., Cleveland, O.
Pangborn, Thomas W., Company, New York.
Paxson, J. W., Co., Philadelphia, Pa.
Turner Machine Co., Philadelphia, Pa.

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(See also Platers' Supplies).
Sommers, John Faucet Co., Newark, N. J.

Sawdust Drying-out Boxes.
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Hanson & Van Winkle Co., Newark, N. J.
Steiner, E. E., Newark, N. J.

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Garrison, A., Fdy. & Machine Co., Pittsburg, Pa.
Torrington Manufacturing Co., Torrington, Conn.
Waterbury (Conn.) Farrel Foundry & Machine Co.
Watson-Stillman Co., New York.

Sheet Metal Straightening, Cutting and Forming Machinery.
Baird Machine Co., Oakville, Conn.
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Blake & Johnson Co., Waterbury, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.
Shuster, The F. B., Co., New Haven, Conn.
Torrington Manufacturing Co., Torrington, Conn.
Waterbury (Conn.) Farrel Foundry & Machine Co.

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Gehnrich, Hermann, New York.
Globe Machine & Stamping Co., Cleveland, O.
Rockwell Furnace Co., New York.

Silicon
American Smelting & Refining Co., Cincinnati, O
Leavitt, C. W., & Co., New York.

Silicon Copper.
American Smelting & Refining Co., Cincinnati, O.
Electric Smelting & Alum'n Co., Lockport, N. Y.
Roessler & Hasslacher Chemical Co., New York.

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(See also Platers' Supplies).
Jackson, John J., Co., Newark, N. J.

Silver Ingots, Bars, Plates, Etc.
Renziehausen, Wm. F., Co., Newark, N. J

Silver, Rolled Sterling
Jackson, John J., Co., Newark, N. J.
Renziehausen, Wm. F., Co., Newark, N. J.
Riverside Metal Co., Riverside, N. J.

Silver Wire.
Jackson, John J., Co., Newark, N. J.

Smelters, Sweep
Renziehausen, Wm. F., Co., Newark, N. J.

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International Chemical Co., Camden, N. J.

Solder, Aluminum
Aluminum Company of America, Pittsburg, Pa.
American Solder Co., Boston, Mass.
Clum & Atkinson, Rochester, N. Y.
Electric Smelt. & Aluminum Co., Lockport, N. Y.
Janney, Steinmetz & Co., Philadelphia, Pa.
Kemp, W. H., Co., New York.
Reinhold Noflux Alum'm Solder Co., Newark, N. J.
Richards & Co., Boston, Mass.
U. S. Reduction Co., Chicago, Ill.

Solder, Brazing
American Smelting & Refining Co., Cincinnati, O.
Hoyt Metal Co., New York.
Hussey, C. G., & Co., Pittsburg, Pa.
Linton & Co., Providence, R. I.
Merchant & Evans Co., Philadelphia, Pa.
National Metal Reduction Co., Cleveland, O.
Naulty Smelting & Ref'g Co., Philadelphia, Pa.
North American Smelting Co., Philadelphia, Pa.
Richards & Co., Boston, Mass.
Shimer, H. M., & Co., Philadelphia, Pa.

Solder, Gold
Linton & Co., Providence, R. I.

Solder, Silver
Jackson, John J., & Co., Newark, N. J.
Linton & Co., Providence, R. I.

Solder, Tinners'
American Smelting & Refining Co., Cincinnati, O.
Merchant & Evans Co., Philadelphia, Pa.
National Metal Reduction Co., Cleveland, O.
North American Smelting Co., Philadelphia, Pa.
Richards & Co., Boston, Mass.

Spelter.
American Smelting & Refining Co., Cincinnati, O.
Birkenstein, S., & Sons, Chicago, Ill.
Fitz, Dana & Co., Boston, Mass.
Grasselli Chemical Co., Cleveland, O.
Hegeler Bros., Danville, Ill.
Hendricks Bros., New York.
Illinois Smelting & Refining Co., Chicago, Ill.
Illinois Zinc Co., Peru, Ill.
Leavitt, C. W., & Co., New York.
Mathiesen & Hegeler Zinc Co., La Salle, Ill.
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New Jersey Zinc Co., The, New York.
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Sandoval Zinc Co., Chicago, Ill.
U. S. Reduction Co., Chicago, Ill.
Vogelstein, L., & Co., New York.

Spinning Lathes.
Pryibil, F., New York.
Schulz, Frits A., Chicago, Ill.

Spraying Machines.
Eclipse Air Brush & Compressor Co., Bloomfield, N. J.
Eureka Pneumatic Spray Co., New York.

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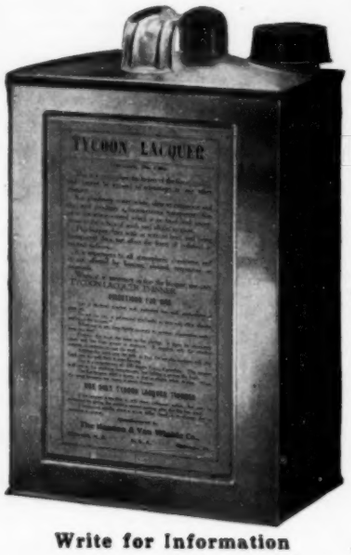
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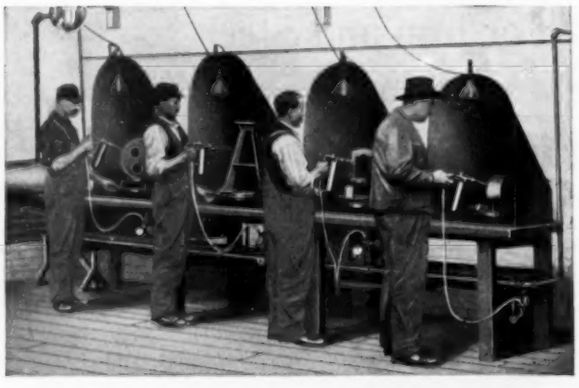
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See Page 60 for Particulars

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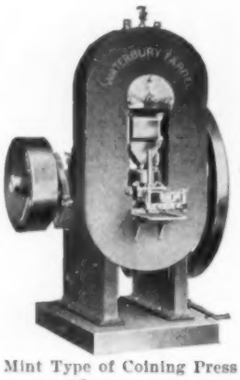
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Mint Type of Coining Press

KNUCKLE JOINT PRESSES

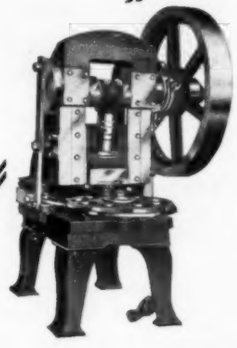
The illustration shows a type used in the United States Mint Service for Stamping coins. Many other patterns equally well adapted for special purposes.

Single Acting Open Back Presses

FOR GENERAL USE

The illustration shows a ratchet dial feed on a heavy open back press, for truing up and sizing, inside and outside, some large malleable iron bushings.

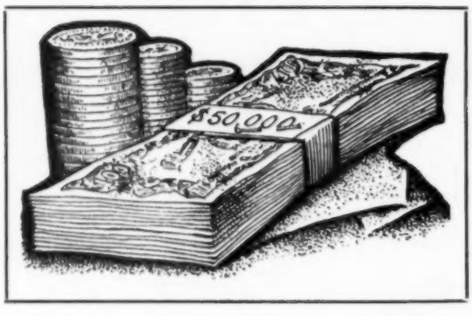
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Waterbury Farrel Foundry & Machine Co.

WATERBURY, CONN.

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Some save to go to a Convention, and some economize after, to make good the expense.

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but you might help that "Sinking Fund" a little if you bought your machinery from me.

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I have everything from Polishing Machines to Glue Stands, including Dynamos, and further, an expert to install them all.

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